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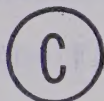
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INTER- AND INTRA-CITY LOCATION PATTERNS  
OF OIL OFFICES FOR CALGARY AND EDMONTON,  
1950-1970

by



GEORGE HENRY ZIEBER

A THESIS

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This study focuses upon the inter- and intra-city location patterns of oil offices in Calgary and Edmonton from 1950 to 1970.

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled INTER- AND INTRA-CITY LOCATION PATTERNS OF OIL OFFICES FOR CALGARY AND EDMONTON, 1950 - 1970 , submitted by George Henry Zieber in partial fulfilment of the requirements for the degree of Doctor of Philosophy.



## ABSTRACT

This study focuses upon the inter- and intra-city location patterns of oil offices for Calgary and Edmonton from 1950 to 1970 and analyzes the factors responsible for the patterns in order to gain an understanding of the impact of the oil industry upon their functional development as oil office centres. It briefly examines the reasons for the development of Calgary rather than Edmonton as the oil administrative centre and the applicability of the dispersed city hypothesis to the functional specialization of the two cities as oil centres. Also, the decision-making process is briefly examined as a variable influencing oil office location.

Two major groups of oil offices, administrative and operations, consisting of twelve specific types were studied. The location patterns for the twelve types were mapped by computer for five data years within the twenty-year study period and geostatistical methods were utilized to facilitate the visual analysis and comparison of the oil office distributions. To gain an understanding of the factors responsible for the patterns and about the decision-making process, 112 oil offices were interviewed in the two cities.

The major findings of the research were:

- 1) Throughout the twenty-year study period Calgary was outstanding as a centre for administrative



oil offices and Edmonton was important as a centre for oil operations offices, particularly Service and Supply, and Transportation and Oilfield Construction.

The prime factor accounting for the location of administrative oil offices in Calgary was the need for frequent contact amongst the offices. Oil operations offices located in Edmonton, primarily, to be near the oil and gas fields and to have good access to exploration activity in Northern Alberta and Canada.

- 2) At the intra-city level, the majority of the oil administrative and operations offices in Calgary for each of the five data years were highly clustered in the Central Area because of the need for face-to-face contacts and due to the availability of good office space. The oil operations offices which were located in Non-Central Calgary were mostly clustered in a South Calgary oil operations district because of the availability of adequate and low-cost space in a good industrial area. In Edmonton, the major factors accounting for the location of administrative oil offices in the Central Area were the good accessibility and the availability of suitable office space. Functional linkages amongst the offices were not strong. The trend for these offices was to locate in Non-Central Edmonton where adequate space was available with good parking. Oil operations offices were



highly clustered in a South Edmonton operations district because of the availability of low-cost space in a good industrial area, the good access to major arterial streets, and the need for contacts amongst the offices.

- 3) The major factor responsible for Calgary's development as the administrative oil centre rather than Edmonton was its early start and experience with oil because of Turner Valley and the exploration activity in Southern Alberta.
- 4) The evidence obtained suggests that the dispersed city hypothesis has considerable relevance to the functional specialization of Calgary and Edmonton as oil office centres.
- 5) The decision-making process had a bearing upon the location of oil offices and should be considered as another factor influencing office location.



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## CHAPTER I

### INTRODUCTION

There is definite need in urban research for studies on office locations, spatial patterns within cities, and comparative analyses of cities. This assertion is supported by recent statements on the status of urban geography and is the foundation upon which this study is based.

Murphy states that "the need is apparent for . . . studies of office-location trends".<sup>1</sup> He further states that "The patterns of individual establishment types form interesting topics for research, especially when the time factor is taken into consideration".<sup>2</sup> Simmons calls for research of a wide variety of urban problems among which are studies of "single cities and patterns within the city".<sup>3</sup> Murphy and Vance point out that comparative studies of cities and city functions are required to give us a better understanding of the city in order to meet the "many problems with which

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<sup>1</sup>R. E. Murphy, The American City. Toronto, McGraw-Hill Book Co., 1966, p. 276.

<sup>2</sup>Ibid., p. 272.

<sup>3</sup>J. Simmons, "Urban Geography in Canada", The Canadian Geographer, Vol. 11, No. 4, 1967, p. 351.



planners and other students of the city are grappling".<sup>4</sup> In a comparative study of two American oil cities, Weber states that "By comparatively analyzing city functions and physical patterns . . . as they exist, for example, in a group of specialized-function cities of similar character . . . one can gain a greater understanding not only of a particular type of city but also of the broad concepts of urban geography."<sup>5</sup>

## THE PROBLEM

### Importance of the Study

Calgary and Edmonton are the two outstanding oil centres of Canada. Together they contain by far the majority of administrative and operations oil offices<sup>6</sup> in Canada.

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<sup>4</sup>R. E. Murphy and J. E. Vance, "A Comparative Study of Nine Central Business Districts," Economic Geography, Vol. 30, 1954, p. 301. See also P. E. James and C. F. Jones, eds. American Geography: Inventory and Prospect, Washington, Association of American Geographers, Syracuse University Press, 1954, p. 158.

<sup>5</sup>D. Weber, A Comparison of Two Oil City Business Centers (Odessa-Midland, Texas), Chicago, Department of Geography Research Paper No. 60, University of Chicago, 1958, p. 5.

<sup>6</sup>In brief an oil office is defined as the place for the administrative activities of a company having a major concern with any phase of the petroleum industry. The administrative oil offices represent the firms or their establishments which perform mainly an administrative function characterized by such activities as coordination and control, exchange, and the giving or receiving of particular business and technical services. They are generally located in the office buildings of the downtown. Oil operations offices are best represented by the offices of firms or their establishments concerned with providing various services, supplies



Separated by approximately 180 miles, the two cities are situated in Canada's major oil and natural gas producing region (Figures 1 and 5). The two centres are comparable in size with Calgary having a population of 385,436 and Edmonton 422,418 in 1970.<sup>17</sup>

Since about 1950 the population growth and concomitant economic development of the two cities has been of the highest of larger urban centres in Canada. The most important single factor stimulating this remarkable rate of growth,

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and fabricated goods for the field activities of the oil industry. Many of these offices are attached to repair and service shops, special laboratories, company garages and warehouses, manufacturing establishments or are associated with storage yards. Some of them are sales offices which may be located in detached office buildings. The above terms are defined more fully in Chapter II.

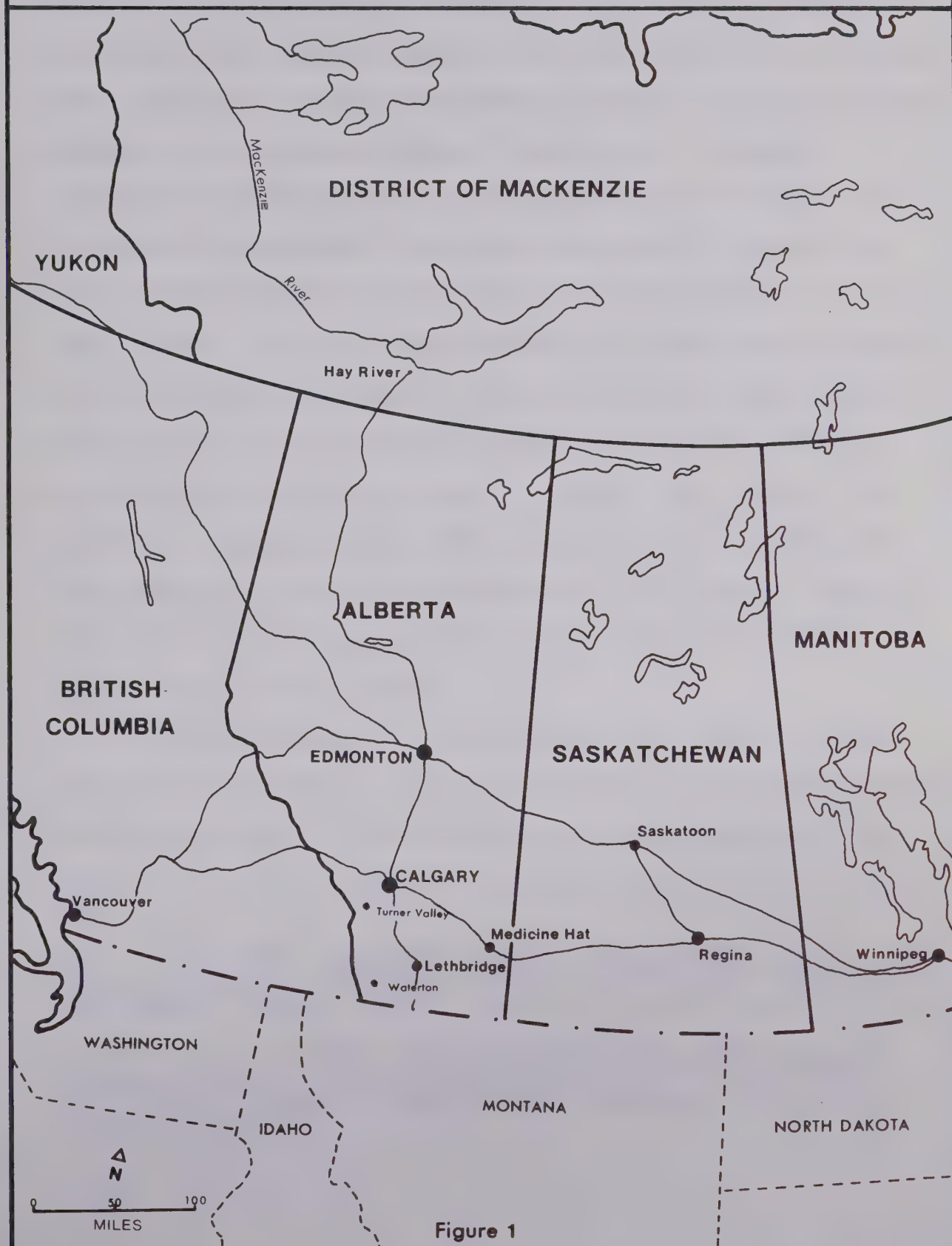
Two additional terms--"firm" and "establishment"--used in the above paragraph should also be clarified because they are used throughout the dissertation.

A "firm" and an "establishment" are not synonymous. The two concepts have been defined by E. M. Fisher and R. M. Fisher, Urban Real Estate, New York, Henry Holt, 1954, p. 315: "An establishment is a person or group of persons occupying a recognizable place of business residence, government or assembly within a spatial unit. It is created when a unit of space is occupied and dissolved when the spatial unit is abandoned. A business establishment should not be confused with a business firm, (which) is a business organization composed of one or more different establishments". The two concepts are also discussed fully by J. Rannels, The Core of the City, New York, Columbia University Press, 1956, pp. 10-17.

<sup>17</sup> Alberta Government, Department of Municipal Affairs, Within Our Borders, August, 1970, p. 2.



## SITUATION OF CALGARY AND EDMONTON





according to Hanson<sup>8</sup> and Saarinen,<sup>9</sup> has been the burgeoning Western Canada petroleum industry. This period of development began with the discovery of the Leduc-Woodbend oil field about 18 miles southwest of Edmonton in 1947, and then gained momentum with subsequent major discoveries. A marked increase of administrative and operations oil offices in the two centres accompanied the rapid expansion of the oil and gas industry after 1947, and was a striking feature of their rapid growth. Indeed, this spectacular growth was a factor which attracted the writer's attention to the topic chosen for research. Also, because Calgary and Edmonton contain by far most of the oil offices in Canada, they present an excellent opportunity for research on the inter- and intra-city patterns of oil office development and location through time, and on the forces behind the evolution of the two cities as oil office centres.

Today, Calgary is recognized as the administrative centre of the Canadian petroleum industry and Edmonton as the operations centre. Some administrative and operations oil office development occurred in Calgary prior to 1947.

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<sup>8</sup>E. Hanson, Dynamic Decade: The Evolution and Effects of the Oil Industry in Alberta, Toronto, McClelland and Stewart, Toronto, 1958. See particularly Chapter 22-24.

<sup>9</sup>T. F. Saarinen, The Changing Office Functions in Calgary's Central Business District 1942-62. Unpublished M.A. thesis, Chicago, Department of Geography, University of Chicago, 1963.



Canada's first major oil discovery was in 1914 at Turner Valley in the Rocky Mountain foothills about 25 miles southwest of Calgary. As a result, Calgary experienced an influx of oil personnel and equipment particularly from the United States, and became an active centre for petroleum exploration, production and management. Smith attributes Calgary's development as the administrative centre to its early start and experience with the oil industry. He states:

Thus when the really important post war discoveries were made, beginning with the Leduc-Woodbend field in 1947, an experienced organization was already in existence and firmly entrenched in Calgary . . . Calgary was able to build dramatically on its early start as a management centre.<sup>10</sup>

The challenge to thoroughly research the reasons for Calgary's development as the oil administrative centre and the need to gain a better understanding of the functional development of both cities as oil office centres, are factors which strongly influenced the choice of the research topic.

The oil industry in Alberta is characterized by a high degree of provincial government involvement, control and regulation.<sup>11</sup> One reason for this regulation is that most of the petroleum rights are government owned so it is vitally concerned with the development of the resource. Another

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<sup>10</sup>P. J. Smith, Change in a Youthful City: Calgary Alberta. Edmonton, Department of Geography, University of Alberta, 1968, p. 5. (Mimeographed)

<sup>11</sup>For a brief but clear statement of the Alberta government's involvement, control and regulation of the oil and gas industry see E. Gray, Impact of Oil, Toronto, The Ryerson Press and Maclean Hunter Limited, Chapter 4.



reason is the need for conservation which has necessitated much interaction between the government and oil companies. Because the provincial government is headquartered in Edmonton and the first major oil discoveries after 1947 were in its region, it would seem that a logical outcome of the need for interaction would be the location of administrative oil offices in Edmonton. However, this development did not occur. The question is: why did it not occur? Had it taken place, then undoubtedly Calgary and Edmonton's development as cities and oil centres would have been drastically altered. Rather than having two major cities of comparable size, Alberta would be dominated by one giant, Edmonton. Likely, Calgary would still be comparatively small.

Furthermore, in the literature related to Calgary, it is stated that with the important oil and gas discoveries in the Edmonton region after 1947, Calgary lost much of the production and processing to Edmonton.<sup>12</sup> Because many oil operations offices are involved with production and processing aspects of the petroleum industry, this statement suggests a decline in Calgary's oil operations function after 1947. However, when the research topic was first being considered, a cursory survey of all oil offices for 1968-69 revealed that Calgary had more oil operations offices than Edmonton. This unexpected fact further aroused an interest in the research topic.

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<sup>12</sup>Smith, op. cit., p. 5.



Historically, Calgary and Edmonton have functioned as quite separate centres. However, Kerr<sup>13</sup> and Hanson<sup>14</sup> have drawn attention to the increasing complementarity of the two cities as oil centres. That is, Calgary as the administrative centre and Edmonton as the operations centre increasingly are functioning as if a single urban unit. In this regard, Kerr has stated that "in particular with reference to the oil industry, the dispersed city hypothesis . . . may have considerable relevance in further investigations of the functional specialization of Calgary and Edmonton."<sup>15</sup> To the writer's knowledge the dispersed city concept<sup>16</sup> had never been applied to the functional specialization of oil centres. Moreover, Burton points out that although there is some evidence for the existence of the dispersed city, nevertheless, "the actual existence of such a phenomenon remains to

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<sup>13</sup>D. P. Kerr, "Metropolitan Dominance in Canada," in J. Warkentin, ed. Canada: A Geographical Interpretation, Toronto, Methuen, 1968, p. 550.

<sup>14</sup>E. J. Hanson and I. C. Robinson, City of Calgary - C.P.R. Downtown Redevelopment Proposals. Report to the Board of Commissioners, Calgary, City of Calgary, 1963, pp. 25-27.

<sup>15</sup>Kerr, op. cit., p. 550.

<sup>16</sup>The "dispersed city hypothesis" refers to politically discrete cities which although separated by tracts of agricultural land function together economically as a single urban unit. See I. Burton, "Retail Trade in a Dispersed City," Transactions of the Illinois State Academy of Science, Vol. 52, 1959, pp. 145-150; H. A. Stafford, "The Dispersed City," The Professional Geographer, Vol. 14, July, 1962, pp. 8-10; T. R. Glennon, A Re-examination of Retail Trade of the Dispersed City of Southern Illinois, State Academy of Science, Wheaton, Illinois, April 27, 1962. (Reported by Stafford, *Ibid.*); I. Burton, "A Restatement of the Dispersed City Hypothesis," Annals, Association of American Geographers, Vol. 53, 1963, pp. 285-289.



be demonstrated".<sup>17</sup> The need to provide evidence of whether or not the hypothesis is relevant to the functional specialization of Calgary and Edmonton as oil centres also invited the writer to investigate the research topic.

At the intra-city level, Calgary's role as the administrative centre is reflected in the form of its downtown. Administrative oil activity is strikingly evident in its highly built-up, skyscraper-dominated downtown. Indeed, Smith points out that:

Calgary's role as the management centre for the oil industry is nowhere more strikingly reflected than in the C.B.D. Large-scale construction of office buildings for oil companies and related businesses has extended the C.B.D. both horizontally and vertically and has transformed the downtown skyline in the process.<sup>18</sup>

On the contrary, there is little outward evidence of oil offices in Edmonton's downtown. Tall oil office buildings are notably absent. These observations by the author raised several questions. Why is there such a high concentration of oil offices in downtown Calgary and what forces are responsible for that development? What accounts for the apparent absence of oil activity in Edmonton's central area?

Thus a search of the literature relating to Calgary and Edmonton and preliminary discussion of the research topic with individuals in the oil industry and in the academic and business communities, revealed a marked lack of specific knowledge about how and why the two cities differ in their

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<sup>17</sup> Ibid., p. 287.

<sup>18</sup> Smith, op. cit., p. 16.



functions as oil centres. It was discovered that little information was available about the inter- and intra-city patterns of oil office development and location over time. Limited knowledge existed concerning the forces responsible for the patterns of development. This lack of knowledge pointed to a serious deficiency in our understanding of the growth of the two cities. Furthermore, for both cities little was known about trends in the inter- and intra-city location of oil offices since the beginning of the oil boom in 1947. Trends to increased concentration in the city centre or to decentralization certainly have implications for planning transportation, parking, and office space requirements. Thus the study was undertaken to provide a better understanding of the impact of the oil industry on the functional development of Calgary and Edmonton as oil centres through time and space. Moreover, the study would also give a better understanding of the nature and development of cities that are similarly outstanding in providing services for a particular economic activity (e.g., oil production).

Another very important reason for undertaking the research was to provide some insights about the decision-making process<sup>19</sup> related to oil office location at both the inter- and intra-city levels. For a full understanding of

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<sup>19</sup> In this study a process is defined as a course of activity or proceeding.



the decision-making process it would be necessary not only to examine the factors taken into account in location of oil offices but also to discover who made the decisions and the methods involved in arriving at decisions. As yet, little is known about the decision-making process.

Finally, the research would provide an opportunity to test some of the existing location theories and concepts and their applicability to oil offices.

### Objectives of the Study

The research project is concerned with the inter- and intra-city development and location of administrative and operations oil offices for Calgary and Edmonton from 1950 to the present.<sup>20</sup>

The first major objective of the research is to determine for Calgary and Edmonton the inter-city patterns of oil office development and location for the period 1950 to 1970, to identify the changes and trends, and then to ascertain the forces responsible for the existing spatial patterns. The body of evidence on these aspects will contribute to an understanding of the evolution of the two cities and should provide some clarification concerning the function each one is performing as an oil centre. More important, however, is the contribution which the study should make to an understanding of the evolution of cities in general. Finally,

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<sup>20</sup>The twenty-year time period from 1950 to 1970 was determined by the availability of adequate data on oil offices for that time.



although it was not the intent of the writer to fully explore the dispersed city hypothesis relative to Calgary and Edmonton, the study should shed some light on the validity of the hypothesis and the merit of applying it to the functional specialization of Calgary and Edmonton as oil centres.

A second objective of the research is to determine the spatial patterns of oil offices within the metropolitan area of each city throughout the twenty-year time period, to determine the changes and trends in location, and to identify the factors accounting for the location patterns as they are today. The data and results should provide a valuable source of information to guide future planning and development for office location as well as for related aspects as transportation and parking.

A third objective of the research is to examine the decision-making process as another variable influencing the location of oil offices at both the inter- and intra-city levels.

Finally, the research involves the study of a very large number of oil offices. The large number presents the problem of representing them cartographically and of analyzing as well as comparing the similarities and differences of their spatial patterns. The research provides an opportunity to apply and test some recently defined geostatistical



aids<sup>21</sup> which yield summary indices to greatly facilitate visual analysis and comparison. To the writer's knowledge these have never been applied to the analysis of office location.

## REVIEW OF THE LITERATURE

### Literature Relevant to the Inter-city Location of Oil Offices

Because Calgary and Edmonton are situated in the heart of Canada's major oil and natural gas producing region, it is assumed that the nearness to these resources has been a strong factor in the location and development of oil offices in the two cities. Hoover<sup>22</sup> points out that the most obvious basis for the location of economic activities is the disposition of natural resources. Moreover, Dickinson states that a town owes much of its essential character to "the needs of its service area and the function it performs for it".<sup>23</sup> Thus in a petroleum producing region related businesses tend to congregrate in major service centres to

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<sup>21</sup>The geostatistical aids to be utilized are "Mean Centre" and "Standard Distance". Standard Distance has recently been refined to analyze changes in population distributions by R. Bachi, "Standard Distance Measures and Related Methods for Spatial Analysis," Papers, Regional Science Association, Vol. 10, 1963, pp. 83-132.

<sup>22</sup>E. M. Hoover, The Location of Economic Activity, Toronto, McGraw-Hill Book Company, 1948, p. 3.

<sup>23</sup>R. E. Dickinson, "The Scope and Status of Urban Geography: An Assessment," in H. M. Mayer and C. F. Kohn, Readings in Urban Geography, Chicago, The University of Chicago Press, 1959, p. 20.



perform various functions for this industry. The need for urban facilities to carry out the administrative function is outlined by Weber as follows:

The exercise of various aspects of administration in an oil region requires urban facilities, amenities, and accommodations that are usually difficult to provide in a newly-opened oil region. But once the necessary accommodations are provided, administrative establishments and personnel thrive and multiply in the area, provided the area continues profitable in its location.<sup>24</sup>

Furthermore, Weber states that the city "that provides the greatest amount of office space may find itself in an excellent position to take advantage of the administrative opportunity promised by the oil industry."<sup>25</sup> Both of these statements strongly suggest one reason for Calgary's development as the administrative centre of the oil industry rather than Edmonton, namely, the fact that office space was made available. This aspect will be examined in detail later in the study.

The development of oil fields requires many services and supplies. Thompson points out that "The completion of a well requires contributions from no fewer than forty-two different specialties."<sup>26</sup> This need leads to the location of operations firms in centres readily accessible to the drilling activity. This fact would account largely for the

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<sup>24</sup>Weber, op. cit., p. 153.

<sup>25</sup>Ibid., p. 159.

<sup>26</sup>C. Thompson, The Industry Nobody Really Knows, Pittsburg, Gulf Oil Corporation, 1956, p. 15.



presence of operations offices in Calgary and Edmonton, but particularly in the latter centre which is closest to the major oil fields (Figure 5).

A factor which is of significance in preserving the location of economic activities in a centre after the initial advantages have declined is the inertia of invested capital. The fact that certain activities stay in a centre may attract additional related activity to that centre and so perpetuate a specific function. Inertia may be a factor of some relevance to the functional specialization of Calgary and Edmonton. Weber, states that:

Major oil centres that have attracted a more permanent share of the industry usually have kept this share. Tulsa keeps its oil offices, although the local boom that created Tulsa has since expired; Bradford, Oil City, and Parkersburg have retained their oil machinery supply and manufacturing firms.<sup>27</sup>

The literature cited gives some insights concerning some of the factors which undoubtedly have played a role in the development of Calgary and Edmonton as oil centres and which account for their functional specialization. However, other factors must also be examined.

Various studies of the location of industry provide some insights regarding the importance of socio-historical factors in location decisions. The findings of these studies have application to the location of oil offices, especially operations offices in Calgary and Edmonton.

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<sup>27</sup>Weber, op. cit., p. 222.



Katona and Morgan<sup>28</sup> in a study of small plant locations in Michigan discovered that personal reasons were the most important factors underlying location decisions. Similar findings were reported by the University of Michigan, Institute of Social Research.<sup>29</sup> It was found that personal preferences for climate and recreational facilities or the fact that the owner of a firm was born in an area, were important location factors in the choice of a specific town. McGovern,<sup>30</sup> in a study of industrial development in the Vancouver, Canada, area discovered that some firms were attracted to the Vancouver area by such characteristics as distance from competitors, proximity to parent companies on the west coast of the United States, and the amenities of the region. Hoover makes reference to the role of historical factors. He reports that "a locality with an early start in some industry has thereby a complete advantage that it may retain and increase even though the early start was due to pure chance or whim".<sup>31</sup> Estall and Buchanan<sup>32</sup> point out the increasing importance of

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<sup>28</sup>G. Katona and J. N. Morgan, "The Quantitative Study of Factors Determining Business Decisions," Quarterly Journal of Economics, Vol. 66, 1952, pp. 67-90.

<sup>29</sup>Survey Research Center, Institute of Social Research, University of Michigan, Industrial Mobility in Michigan. University of Michigan, May, 1951, p. 2.

<sup>30</sup>P. D. McGovern, "Industrial Development in the Vancouver Area," Economic Geography, Vol. 37, 1961, pp. 189-206.

<sup>31</sup>Hoover, op. cit., p. 4.

<sup>32</sup>R. C. Estall and R. O. Buchanan, Industrial Activity and Economic Geography, London, Hutchinson University Library, 1961, pp. 144-146.



promotional activities of local organizations and local attitudes as factors influencing location decisions.

Even though economic factors play a role in accounting for the inter-city location of urban activities, recognition also must be given to socio-historical factors which have largely been ignored in empirical research. The extent to which economic and socio-historical factors have been of import in the development and location of oil offices in Calgary and Edmonton is unknown. The question as to whether or not Calgary's early start in the oil industry explains its function as the administrative centre and its many operations offices remains to be answered. This study seeks to evaluate to what extent socio-historical factors as well as others have influenced the inter-city location of oil offices for Calgary and Edmonton.

#### Literature Relevant to the Intra-city Location of Administrative Oil Offices

Administrative oil offices, although composed of different types of firms have much in common in their exercise of the various aspects of administration<sup>33</sup> and in their dependence upon one another. In terms of location they usually are associated with the office buildings characteristic of the central business district. Thus, it is highly likely that some of the factors in their location are similar to those for offices in general.

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<sup>33</sup>See footnote 6.



According to the traditional theories of the internal structure of cities (i.e., the concentric zone theory proposed by Burgess<sup>34</sup> in 1923, and the multiple nuclei theory advanced by Harris and Ullman<sup>35</sup> in 1945) the location of office development has traditionally been in the centre of the city. Both theories, based on economic arguments, hold that offices are located at the city centre because they can successfully compete in the real estate market, i.e., pay high rents for sites having high accessibility or ease of contact with low public transportation costs. Haig<sup>36</sup> and Ratcliff<sup>37</sup> explain the central location in terms of "accessibility" or the minimizing of transportation costs for employees and customers and "cohesion of functions" or the maximizing of convenience for face-to-face contacts and communication. Ullman contends that "apparently the subtle linkages between office functions

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<sup>34</sup>E. W. Burgess, "The Growth of the City: An Introduction to a Research Project," in R. E. Park, E. W. Burgess and R. D. McKenzie (eds.), The City. Chicago, University of Chicago Press, 1925, pp. 47-62.

<sup>35</sup>C. D. Harris and E. L. Ullman, The Nature of Cities. Annals of the American Academy of Political and Social Science, Vol. 242, 1945, pp. 7-17.

<sup>36</sup>R. M. Haig, Major Economic Factors in Metropolitan Growth and Arrangement. New York, Regional Plan of New York and Its Environs, 1927.

<sup>37</sup>R. U. Ratcliff, "The Dynamics of Efficiency in the Locational Distribution of Urban Activities," in H. M. Mayer and C. F. Kohn, Readings in Urban Geography. Chicago, University of Chicago Press, 1959, pp. 299-324.



creates a centralized demand".<sup>38</sup>

In a research report of 1967, Wright points out that in a survey of 255 offices in central London, "contact with other organizations was easily the most important single (location) factor".<sup>39</sup> An earlier study of 728 offices in central London concurs with Wright's findings.<sup>40</sup>

Foley's<sup>41</sup> study of the suburbanization of administrative offices in the San Francisco Bay area of California concluded that some administrative offices were still greatly attached to a central location. Some of the main reasons given by firms for locating in the central district were: to maintain maximum accessibility to the central district and to the whole metropolitan area, to take advantage of the superior office space, to stay within easy reach of the main office-worker labor market; to be readily accessible to the business and professional services and other external economies of the central district; to maintain a traditional and prestigious location; and to accommodate and be most

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<sup>38</sup>E. Ullman, "The City Centre," Symposium Discussion in Proceedings of the I.G.U. Symposium in Urban Geography, Lund, 1960. K. Norborg (ed.) Sweden, Royal University of Lund, 1962, p. 599.

<sup>39</sup>M. Wright, "Provincial Office Development," Urban Studies, Vol. 4, 1967, p. 239.

<sup>40</sup>The Economist Intelligence Unit, A Survey of Factors Governing the Location of Offices in the London Area. London, The Location of Offices Bureau, January, 1964.

<sup>41</sup>D. Foley, The Suburbanization of Administrative Offices in the San Francisco Bay Area. Real Estate Research Program, Bureau of Business and Economic Research, University of California, 1957.



accessible to the out-of-town visitor.

Vernon<sup>42</sup>, director of the large New York Metropolitan Region Study that was carried out between 1956 and 1959, states that office activities of an "elite" nature, those concerned with seeking solutions to unstandardized problems and often requiring the services of outside specialists, still need to be at the city centre. Hoover and Vernon<sup>43</sup>, both associated with the New York Metropolitan Region Study, suggest that a central location for offices is also dependent upon the attraction the area holds for young women who constitute such a large portion of the office force.

Field and Kerr<sup>44</sup> state that social factors described in terms of such facilities as clubs, hotels, and shops are by no means insignificant in locational considerations. Social factors may be very relevant to a partial understanding of the reasons for the clustering of administrative offices in Calgary's downtown.

In spite of the increasing tendency for offices to locate in the central area of cities, Ullman states that

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<sup>42</sup>R. Vernon, The Changing Economic Function of the Central City. New York, Area Development Committee, New York Metropolitan Regional Study, 1959.

<sup>43</sup>E. M. Hoover and R. Vernon, Anatomy of a Metropolis. Cambridge, Mass., Harvard University Press, 1959, p. 98.

<sup>44</sup>N. C. Field and D. P. Kerr, Geographical Aspects of Industrial Growth in the Metropolitan Toronto Region. Toronto Regional Development Branch, Department of Treasury and Economics, Ontario Government, October, 1968, p. 5.



"many offices are also moving out".<sup>45</sup> This trend has been most pronounced since World War II. Foley<sup>46</sup> reported a marked suburbanization of certain administrative offices in the San Francisco Bay area especially following 1948. Almost all which relocated became attached to non-office facilities in the suburbs. Some of the reasons given by firms for relocating in the suburbs were: to locate with a manufacturing plant or other non-office operating facility which is advantageously located in a suburban district, to permit office workers and executives to live in a nearby suburban area with a relatively short trip to work, to gain flexible and expansible office space with suburban-type amenities, to reduce office rental, and to escape from downtown congestion. Whether there has been a similar decentralization of administrative oil offices from Calgary's and Edmonton's central areas is largely unknown. This aspect will be investigated as well as the forces which may have effected any shifts.

Decentralization of offices is attributed by Ratcliff<sup>47</sup> to the greatly improved accessibility of non-central areas as a result of the automobile and to the decreased accessibility of the central area because of traffic congestion. According to Ratcliff the increased use of the

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<sup>45</sup>Ullman, op. cit., p. 599.

<sup>46</sup>Foley, op. cit.

<sup>47</sup>Ratcliff, op. cit., pp. 299-324.



automobile makes it possible to keep up face-to-face contacts over greater distances and, therefore, offices are less dependent upon a central location.

Concerning trends in location of offices, both Vance<sup>48</sup> and Edwards<sup>49</sup> theorize that in future offices will be the most important commercial land use in the structure of the city centre in both America and Europe. Vance also states that a "growing body of urbanists in the United States views the core (city centre) as a place of offices rather than of large stores".<sup>50</sup> Allpass<sup>51</sup> hypothesizes that the increased use of telecommunications will make all places within the city and even the region just as much accessible as the central business district itself. Therefore, there will be greatly reduced or little need for face-to-face contacts and consequently little need for physical concentration at the city centre. The result will be decentralization. Fleisher says that although television may replace many kinds

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<sup>48</sup>J. E. Vance, "Emerging Patterns of Commercial Structure in American Cities," Proceedings of the I.G.U. Symposium in Urban Geography, Lund, 1960. K. Norborg (ed.) Sweden, Royal University of Lund, 1962, p. 517.

<sup>49</sup>K. C. Edwards, "Trends in Central Area Differentiation," Proceedings of the I.G.U. Symposium in Urban Geography, Lund, 1960. K. Norborg (ed.) Sweden, Royal University of Lund, 1962, p. 519.

<sup>50</sup>Vance, op. cit., p. 517.

<sup>51</sup>J. Allpass, "Urban Centres and Changes in Centre Structure," Urban Core and Inner City, Proceedings of the International Study Week, Amsterdam 1966, E. J. Brill, 1967, pp. 103-117.



of face-to-face meetings "it may not be adequate for transactions which would terminate in a handshake or a fist fight".<sup>52</sup> In other words, direct contact between individuals will still be required for certain business transactions.

From a review of the literature, it is apparent that a wide range of views and assumptions exist about office location factors and trends. Without doubt, some of the factors influencing the location of offices in general, are the same for administrative oil offices. Assumedly, some factors differ. Indeed Morgan asserts that "there are different types of offices, however, as there are different types of industries and the factors influencing their location vary accordingly".<sup>53</sup> This study attempts to discover how and why oil offices differ from other offices concerning location factors.

Much more knowledge needs to be gained about trends in the location of specific types of offices. The trends for administrative oil offices in Calgary and Edmonton appears to be toward increasing clustering within the central area. The exact nature of and reasons for this interdependence and clustering must be examined to understand their specific locational requirements and the trends in location.

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<sup>52</sup>A. Fleisher, "The Influence of Technology on Urban Forms," in L. Rodwin (ed.) The Future Metropolis. New York, George Braziller, 1961, p. 70.

<sup>53</sup>W. T. W. Morgan, "A Functional Approach to the Study of Office Distributions: Internal Structures in London's Central Business District." Tijdschrift Voor Econ. en Soc. Geographie, Vol. 52, August, 1961, p. 207.



Literature Relevant to the Intra-City  
Location of Oil Operations Offices

Oil operations offices, associated with the goods handling phase of the petroleum industry, are concerned mainly with the physical operations of the industry or the wide range of field activities. They outnumber administrative oil offices in variety of types and tend to be much more widely dispersed in location. Many are physically attached to establishments which may be categorized as light industry, and a few to establishments considered as heavy industry or wholesaling. Others are associated with large yards or garages for the maintenance and storage of oil field equipment, or with shops concerned with field services. There are also the operations offices housed in detached office buildings where sales is the prime concern. This variety presents somewhat of a problem in analyzing their locational factors. However, since many are associated with establishments which may be classified as light industry, a brief review will be made of some of the literature which pertains particularly to the location of light industry.

Oil operations offices, like light industry, are not characteristic of the central business district as are administrative oil offices. However, with reference to light industry, Bartholomew<sup>54</sup> points out that the light industrial area has in the past centered on the central business

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<sup>54</sup>H. Bartholomew, Land Uses in American Cities.  
Cambridge, Harvard University Press, 1955, p. 52.



district. He states that "the area sometimes surrounds the business core, but most often it is to one side or another of the major commercial concentration."<sup>55</sup> He explains this location pattern in terms of the strong ties which still exist between certain light industry and the central area. This pattern of location corresponds with the location pattern of light industry according to the Burgess<sup>56</sup> concentric zone concept of urban structure and Harris and Ullman's<sup>57</sup> multiple nuclei theory. In accord with the multiple nuclei theory, light industry is attracted to this peripheral downtown location because of railway facilities, the old loft buildings which provide comparatively cheap space and the central location with reference to the entire city.

Light industry, however, is in competition with other urban activities for land, space and accessibility. Because of the centrifugal demands of low rent, lack of congestion, space and transport route accessibility<sup>58</sup> light industry is therefore scattered or clustered in a number of sections throughout the city.

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<sup>55</sup>Loc. cit.

<sup>56</sup>Burgess, op. cit., pp. 47-62.

<sup>57</sup>Harris and Ullman, op. cit., pp. 7-17.

<sup>58</sup>C. C. Colby, "Centrifugal and Centripetal Forces in Urban Geography," in H. M. Mayer and C. F. Kohn, Readings in Urban Geography. Chicago, University of Chicago Press, 1959, pp. 287-298.



Because of the need for transport route accessibility, which as Murphy<sup>59</sup> suggests, is becoming very important as a location factor, oil operations offices, like light industry should be found in ribbons along the main gateways and arterials of the city. This location pattern conforms with Hoyt's<sup>60</sup> sector concept of urban structure.

The need for space, low-cost land or cheap rent, non-congested streets and facilities leads to the location of light industry in peripheral zones of the city. Firms may be found scattered singly "throughout the poorer residential areas of the city"<sup>61</sup> or clustered in outlying industrial areas. A new element in outlying industrial areas is the planned industrial district which according to Pasma is a tract of land "subdivided and developed according to a comprehensive plan for the use of a community of industries, with streets, rail lead tracks, and utilities installed before sites are sold to prospective occupants".<sup>62</sup> Murphy states that "often there are close relationships between the

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<sup>59</sup>Murphy, op. cit., p. 342.

<sup>60</sup>H. Hoyt, (U.S. Federal Housing Administration), The Structure and Growth of Residential Neighborhoods in American Cities. Washington, U.S. Government Printing Office, 1939.

<sup>61</sup>Murphy, op. cit., p. 341.

<sup>62</sup>T. K. Pasma, Organized Industrial Districts: A Tool for Community Development, Area Development Division, Office of Technical Services, U.S. Department of Commerce, 1955, p. 1. Quotation in R. E. Murphy, The American City. Toronto, McGraw-Hill Book Company, 1966, p. 342.



concerns represented in an organized industrial district".<sup>63</sup>  
Linkages thus are an important factor in the clustering.

Besides the location factors discussed above, personal and historical factors may also influence location decisions.

In conclusion, it is expected that many oil operations offices will be characterized by location factors similar to those for light industry which may result in similar location patterns. Those oil operations offices concerned mainly with sales will probably have much in common in terms of location with administrative oil offices. Finally, there will be a few oil operations offices, such as those associated with refineries, which will be found on the outskirts of the two cities because of factors such as obnoxious odors from the plant and the firm's need for large tracts of land.

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<sup>63</sup>Murphy, op. cit., p. 342.



## CHAPTER II

### METHODOLOGY

In Chapter I the terms oil office, administrative oil office and operations oil office were introduced and briefly defined. However, it is necessary to fully define and enlarge upon the terms because a clear understanding of them is vitally important.

For the purpose of this study an oil office is defined as the place for the administrative activities of a company having a major concern with any phase of the petroleum industry. Depending upon the size of the company and the nature of the function it performs for the petroleum industry, the place for its administrative activities may consist of a specialized office building devoted entirely to the affairs of that company, a suite of offices in an office building, or a room or two attached to a shop, warehouse or factory. Furthermore, the oil office may be considered as either the headquarters or branch office of a company or firm.

Companies having a major concern with the petroleum industry may be organized into four broad phases of activity.<sup>1</sup>

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<sup>1</sup>D. Weber, A Comparison of Two Oil City Business Centers (Odessa-Midland, Texas). Chicago, Department of Geography Research Paper No. 60, University of Chicago, 1958, p. 5. This classification is used in the Petroleum Data Book, (Second Edition). Dallas, The Petroleum Engineer Publishing Company, 1948.



They are: 1) exploration, production and development, 2) transportation and storage, 3) manufacturing and processing, and 4) marketing.

The exploration, production and development phase includes first of all those firms that are incorporated as oil companies whose primary interest is to discover and develop oil and natural gas. These firms are often classified as the Producers, Explorers and Developers. Essentially, it is they who call into being the whole host of related activities and occupations of the other phases. Second, it includes a wide range of firms and occupations which provide various services. There are the services of geologists, geophysicists, chemical and petroleum engineers, seismologists, lease brokers, land agents, surveyors, economic consultants, investment firms, cartographers, data processors as well as others.

The transportation and storage phase is best exemplified by pipeline companies for the movement of oil and natural gas. However, it also includes trucking firms engaged in the movement of crude oil and processed natural gas, and companies which operate storage caverns for liquid petroleum gas.

The manufacturing phase of the industry includes the oil refiners and the processors of natural gas.

Marketing includes the firms or their establishments concerned with the marketing and distribution of oil and



natural gas products. For example, there are the bulk oil and gasoline wholesalers, the distributors of propane and butane gas, the firms which market crude oil, natural gas and industrial fuel oil and also the marketers of petroleum by-products. Service stations, however, are not included because their function is essentially of a retail service nature.

Associated with all of the aforementioned phases are a wide variety of service and supply companies. To qualify the office of any one such company as an oil office, it is necessary that the company do at least 50 per cent<sup>2</sup> of its business with the petroleum industry.

#### CLASSIFICATION OF OIL OFFICES

Although any office is the scene of administrative activities whatever the firm's business, nevertheless a somewhat arbitrary yet significant distinction is made between two groups of oil offices--administrative oil offices and oil operations offices.

##### Administrative Oil Offices Group

The administrative oil offices are offices of firms or their establishments that perform mainly an administrative

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<sup>2</sup>Fifty per cent is the figure used by the C. O. Nickle Publications Company Limited, Calgary as its criteria for listing any service and supply company as an "oil company" in its Canadian Oil Register. The Register was the prime source of information for the oil offices analyzed in this study.



function and are characterized by such activities broadly described as coordination and control, exchange, and the giving or receiving of particular business and technical services. They are best exemplified by the departmentalized head or branch offices of the major oil companies which deal exclusively with such matters as management, finance, and decision making. Other examples include the offices of independent oil operators (many of whom are small), oil brokers, geological, geophysical and engineering consultants, lease brokers, financial and investment firms and land agents. There are also special administrative services as oil reports and record companies, data processors, as well as oil libraries.

#### Oil Operations Offices Group

The operations oil offices represent the firm or their establishments concerned with providing various supplies and fabricated goods for the field activities as seismic and oilwell drilling, oilwell servicing, oilfield construction and transportation. This group also includes the refiners, natural gas processors, and pipeline companies.

Many of the operations offices are attached to repair and service shops, special laboratories, warehouses, garages, refineries or are associated with storage yards. Others are in detached buildings and may be concerned primarily with sales.



### Oil Office Types Within the Administrative and the Operations Group

The names of oil offices were obtained from Nickle's Canadian Oil Registers<sup>3</sup> which list oil offices according to twelve types. For the purposes of this research the types included within each group were:

#### Administrative Group

1. Oil and Gas Producers, Explorers and Developers
2. Consultants--geological, geophysical, engineering, surveying, and Data Processors
3. Financial and Investment
4. Lease Brokers and Land Agents

#### Operations Group

1. Service and Supply Companies
2. Oilwell Drilling Contractors
3. Engineers, Designers, Constructors and Fabricators
4. Geophysical Contractors and Exploration Drilling Contractors
5. Oilwell Servicing
6. Pipeline Companies and Power Distributors
7. Refiners, Processors, Marketers and Plant Operators
8. Transportation and Oilfield Construction

Several comments should be made about this classification. A number of companies were listed in the Registers with more than one of the twelve types. In most cases, however, the several activities engaged in by those companies were either all administrative or operations in nature. Also, some of the major integrated oil companies of the Producers, Explorers and Developers type have branch offices

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<sup>2</sup>Nickle's Canadian Oil Register. Calgary, C. O. Nickle Publishing Company. Published annually.



termed operations offices which are concerned largely with directing the field activities of the company. These were included with the administrative group.

#### DEFINITION OF THE STUDY AREAS

The study areas are essentially the City of Calgary and the City of Edmonton. For the latter it was necessary to include part of the County of Strathcona to the east of the city boundary where a number of oil firms are located. For Calgary portions of the northern and southern fringes of the city which contained no oil offices were not included on the final maps. The relationship of each mapped area, designated as the study area, to the respective boundary of each city is shown in Figure 2.

For each city a central area was delimited for several reasons. It made possible a tabulation of the number of oil offices within and without a central area and facilitated the study of office centralization and decentralization. Moreover, it was necessary to use a large-scale map of a central area because of the great concentration of oil offices within individual buildings and the problem of locating them on the smaller-scale city map.

The basis of the delimitation was mainly intuitive. A knowledge of the two cities and preliminary investigation of the location of oil offices suggested that oil offices not wanting to be in the congested central business district but still needing a central location would locate within one mile



# RELATIONSHIP OF EACH STUDY AREA TO THE BOUNDARY OF EACH CITY

( Study Area Shown in Gray )

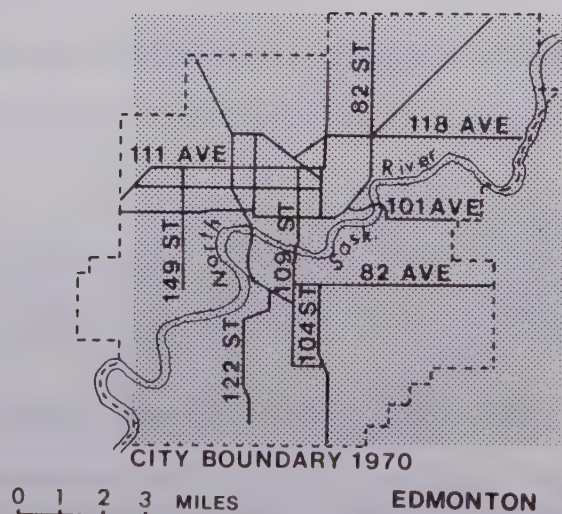
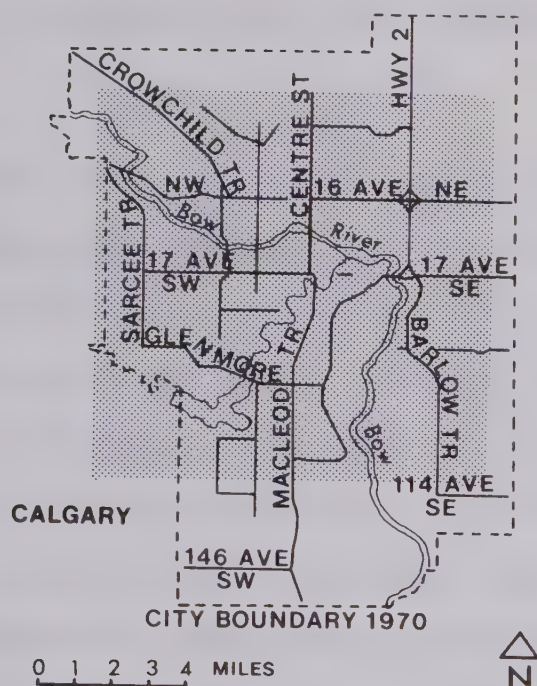


Figure 2



of the city centre. Within this radius access to the city core under normal business-hour traffic conditions for both cities approximates 5 minutes by private automobile and 7 minutes by public transportation.<sup>4</sup>

## SOURCES OF DATA AND INFORMATION

### Oil Registers

One very basic source of data for the research was Nickle's Canadian Oil Register<sup>5</sup>. This register which is issued and revised annually, was available from the date of its first publication in 1951. Because this date essentially marks the beginning of the most recent boom period of the petroleum industry in Alberta, the registers provided an excellent record of the development and location of the various oil offices in both Calgary and Edmonton. Concerning their reliability, it was felt by Mr. J. Miller<sup>6</sup>, editor of the Register, that the Registers were 99 per cent accurate in including and listing all companies having a major concern (as defined earlier) with the various phases of the

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<sup>4</sup>City of Calgary Engineering Department, Calgary Transportation Study. Vol. 1, December, 1967, Figures 5:9 and 5:10 (1964); Edmonton Regional Planning Commission, Metropolitan Edmonton Transportation Study, Vol. 1, 1961, Figures 16 and 17 (1961).

<sup>5</sup>Nickle's Canadian Oil Register, op. cit.

<sup>6</sup>Interview with Mr. J. Miller, September 23, 1969. The C. O. Nickle Publishing Company constantly follows all new companies incorporated in centres across Canada. Also, since the first Register, the Company has maintained a consistent policy of including companies in the Register as oil firms.



petroleum industry.

Each Register lists the head and branch offices as well as gives other information for oil firms according to the twelve types.

### Other Published Material

Besides Nickle's Oil Registers, other sources of data and information include books such as Dynamic Decade<sup>7</sup> by E. Hanson, and The Impact of Oil<sup>8</sup> by E. Gray, telephone directories, Oilweek<sup>9</sup>, the Census of Canada, and newspapers. In addition there are various publications by the oil and gas departments of the banks, the City Planning Departments, the Canadian Petroleum Association and others.

### Personal Interviews

Personal interviews with administrative and operations firms as well as with persons highly knowledgeable with the development of Calgary and Edmonton as oil centres were the prime source of information about the factors which have influenced the location of oil offices. They were also used to gain insights into the decision-making process and to obtain information on inter- and intra-city office moves.

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<sup>7</sup>E. J. Hanson, Dynamic Decade: The Evolution and Effects of the Oil Industry in Alberta. Toronto, McClelland and Stewart, 1958.

<sup>8</sup>E. Gray, The Impact of Oil. Toronto, The Ryerson Press and Maclean-Hunter Limited, 1969.

<sup>9</sup>Oilweek, Calgary, Maclean-Hunter Limited, Published Weekly.



The interview survey design will be discussed in Chapter IV.

#### THE STUDY PERIODS AND NUMBER OF OIL OFFICE ESTABLISHMENTS INVOLVED

It was decided to map and analyze the twelve types of oil offices by five-year intervals for the 1950-1970 period. The following years were chosen: 1) 1950-51 (the date of publication of the first Oil Register), 2) 1954-55, 3) 1959-60, 4) 1964-65, 5) 1969-70. Throughout the twenty years, oil companies continually exited from the business, became dormant or inactive, and new ones were born. The total number of oil offices analyzed and mapped for the five individual data years was 8,754. However, the actual number which existed during the 1950-70 period is only 4,905 since the same oil office may have been present during several or all of the five time periods. Record was kept not only of the 8,754 oil offices in Calgary and Edmonton, but also of all the head oil offices in Canada which had no connections with Calgary or Edmonton. Reference will be made to these in the next chapter.

#### DATA PROCESSING AND COMPUTER MAPPING

The many oil offices necessitated the use of the computer for the processing of the data. The following information about each oil office was coded and put onto computer cards:

1. Company name. Each oil office establishment was identified by company name and a code number. In this way it



was possible to trace individual oil office establishments throughout the entire study period. In the majority of cases, there were either one or two establishments for each company, i.e. either a head office or a head office and a branch office.

2. Type of oil office. This is the designation of each oil office according to one of the twelve types outlined previously.
3. Map location. Mapping of oil offices was done at two scales: a) 1 inch to 2000 feet for Calgary and Edmonton. b) 1 inch to 400 feet for the Central Area of Calgary and of Edmonton. These large scale maps were necessary to show the location and concentration of the various oil offices within individual buildings.
4. Location by grid coordinates. All oil office locations which were plotted on the city maps were referenced to a one-tenth inch scale grid and given an "x" and "y" coordinate value. At this scale each one-tenth inch represented one whole unit of distance. For the Central Area maps the whole unit grid lines were made to correspond in location to the lines of the city map grid. In addition, however, each whole unit of distance was subdivided into fractional units to permit plotting of oil office locations by individual buildings. The value of synchronizing the large scale grid with the small is that it was possible to do any computer tabulations for all



offices or any one type at the one city scale.

5. Head office and branch office location relationships. A code was used to indicate whether the head and/or branch offices were located in each of Calgary and Edmonton. It also was used to designate which head offices in Calgary had branch offices in Edmonton and vice versa as well as which head and/or branch offices in each of Calgary and Edmonton had head and/or branch offices elsewhere in Alberta, in Canada or in the United States.

It should be pointed out that attempts were made to obtain from the Assessment Department of each city the floor area for the oil offices in order to obtain the total floor space occupied as well as to give an indication of office size. However, unfortunately, this information was not made available. Thus the offices are dealt with in essentially an unweighted sense with each one treated as a unit.

Mapping of the spatial patterns of the twelve types of oil offices for each of the five data years was done by computer at the city and central area scales. These computer maps were then collated with prepared base maps showing the street grid and reduced photographically to page size.

The computer also was used to tabulate statistical information about the oil office types.

#### ANALYZING OIL OFFICE LOCATION BY MEANS OF GEOSTATISTICAL AIDS

The large number of oil offices being dealt with in



the study and the likelihood of their being widely scattered in location presented the problem of trying to visually analyze and compare their point distribution on maps. To facilitate comparison and to make differences within and among distributions more readily visible, it was decided to utilize some geostatistical aids. They are "mean centre" and "standard distance", both centrophagic techniques.

The centrophagic technique involves the application of conventional statistical measures to the data of areal distributions. Timms points out that a distribution may differ from other distributions in the two following fundamental ways, in addition to variations in the number of units involved in its population:<sup>10</sup> "First, it may differ in terms of the position or positions around which it tends to cluster (i.e., its centre), and second, it may differ in the way its component units are scattered around this centre."<sup>11</sup> Warntz and Neft<sup>12</sup> state that both features are readily amenable to measurement.

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<sup>10</sup>The word "population", is used in the statistical sense.

<sup>11</sup>D. Timms, "Quantitative Techniques in Urban Social Geography," in R. J. Chorley and P. Haggett, Frontiers in Geographical Teaching. London, Methuen and Company, 1965, p. 244.

<sup>12</sup>W. Warntz and D. Neft, "Contributions to a Statistical Methodology for Area Distributions," Journal of Regional Science, Vol. 2, No. 1, 1960.



The mean centre<sup>13</sup> of an areally distributed population is its balancing point or centre of gravity which corresponds to the arithmetic mean of conventional linear statistics. For its computation a square grid is superimposed on a map. Usually its point of origin is at the bottom left-hand corner of the map area. Then the location of each member of the population (in this case oil office) is plotted and expressed in terms of the x and y coordinate of the grid. Where there is more than one member at one location, then the x and y measurement is weighted by the total number of members at the location. The sum of the terms for the entire map area divided by the total map population gives weighted mean positions along each of the coordinates. The mean centre of the distribution then may be found at the intersection of the mean of the x's and the y's using the following formula:<sup>14</sup>

$$\Delta = \bar{x} = \frac{\sum_i (x_i P_i)}{\sum_i P_i} \quad \text{and} \quad \bar{y} = \frac{\sum_i (y_i P_i)}{\sum_i P_i}$$

where  $\Delta$  = the mean centre

$\Sigma$  = the sum of

$x_i$  = the x coordinate of the i'th point in a series i...n

$y_i$  = the y coordinate of the point i in the series

$P_i$  = the population or weighting factor of the point i.

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<sup>13</sup>Ibid., Warntz and Neft define the mean centre as "the point where the sum of the squares of the distances to the individuals comprising the population will be a minimum", p. 48.

<sup>14</sup>Timms, loc. cit.



Standard distance which is similar to standard deviation in linear statistics is used to measure the dispersal of the population about the mean centre. Recently, it has been refined by Bachi<sup>15</sup> who used it as a method to analyze changes in population distributions within countries. Its uses as a technique in urban land use analysis has been outlined by Ter Hart.<sup>16</sup>

The standard distance parameter is made up of two components which represent the variance of the x and y values from the mean centre. It is expressed by the formula:<sup>17</sup>

$$d = \sqrt{\frac{\sum (P_i \{x_i - \bar{x}\}^2)}{\sum P_i} + \frac{\sum (P_i \{y_i - \bar{y}\}^2)}{\sum P_i}}$$

where d = the standard distance

$x_i, y_i$  = the coordinates of the i'th member of the population from i.....n.

$P_i$  = the population or weighting factor of the i'th member of the population

$\bar{x}, \bar{y}$  = the mean values of the x and y coordinates, the two components of the mean centre.

The directions of the axes of the grid from which the x and y deviations are calculated are normally north-south

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<sup>15</sup>R. Bachi, "Standard Distance Measures and Related Methods for Spatial Analysis," Papers, Regional Science Association, Vol. 10, 1963, pp. 83-132; R. Bachi, An Introduction to Geostatistics, Mif'al ha Shichpul, Jerusalem, 1965.

<sup>16</sup>H. W. Ter Hart, "The Application of Some Geostatistical Models in Urban Geographical Research," (Dutch text English summary), Tijdschrift voor Economische en Social Geographie, Vol. 59, 1968, pp. 25-32.

<sup>17</sup>D. Timms, op. cit., 245.



and east-west. However, the maximum and minimum direction of scatter of the population may be at an angle from the directions of the grid axes. Therefore, the deviations may not best summarize the dispersal of the distribution. Bachi<sup>18</sup>, however, modified the standard distance parameter to permit the rotation of the axes of the original grid around the origin until such a point is reached whereby one of the variances is maximized and the other minimized. In doing this the mean centre and points in the distribution receive new coordinates but the value of the standard distance remains the same. In other words, it is still summarizing the scatter of points that themselves are fixed and that are in the same relative location to one another and to the mean centre. If an anticlockwise rotation is considered positive, the new values of the original x and y coordinates will be:

$$x'_i = x_i \cos \alpha + y_i \sin \alpha$$

$$y'_i = y_i \cos \alpha - x_i \sin \alpha$$

where  $x'_i$  and  $y'_i$  = the new coordinates of point 'i' at angle of rotation  $\alpha$ .

and  $x_i$  and  $y_i$  = the original coordinates of point 'i'.

The following formula<sup>19</sup> expresses the values of the two deviations or variances at the angle of rotation  $\alpha$  :

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<sup>18</sup> Bachi, "Standard Distance Measures and Related Methods for Spatial Analysis," op. cit., p. 88.

<sup>19</sup> S. Waterman, Some Aspects of the Urban Geography of Acre, Israel. Unpublished Ph.D. thesis, Dublin, Trinity College, University of Dublin, 1969, p. 83.



$$\sigma_{x'}^2 = \sigma_x^2 \cos^2 \alpha + \sigma_y^2 \sin^2 \alpha + 2 \operatorname{cov}(x,y) \sin \alpha \cos \alpha$$

$$\sigma_{y'}^2 = d^2 - \sigma_{x'}^2$$

where  $\sigma_{x'}^2, \sigma_{y'}^2$  = the variances calculated from the rotated coordinates

$\sigma_x^2, \sigma_y^2$  = the variances at the original coordinates

$\alpha$  = the angle of rotation

$\operatorname{cov}(x,y)$  = the covariance of the original coordinates

$d^2$  = the square of the Standard Distance.

The following formula<sup>20</sup> is now applied to find the angle  $\alpha_m$  at which one of the variances is maximized and the other minimized:

$$\alpha_m = \frac{\tan^{-1} \frac{2 \operatorname{cov}(x,y)}{(\sigma_x^2 - \sigma_y^2)}}{2}$$

where  $\alpha_m$  = the angle of rotation at which one of the variances is maximized and the other minimized.

$\operatorname{cov}(x,y)$  = the covariance of the original x and y coordinates

$\sigma_x^2, \sigma_y^2$  = the variances of the original x and y coordinates.

Now that the directions and dimensions of the maximum and minimum distribution of the population are expressed quantitatively as a distance and an angle to the original axes, it is possible to map the summary of the distribution.

To represent the distribution cartographically in

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<sup>20</sup>Waterman, op. cit., p. 84.



summary form, a cross is drawn on a map with the intersection of the arms at the mean centre of the population distribution. The directions of the arms correspond to the angle of the maximum and minimum direction of population distribution. In length they are drawn proportional to the standard deviation of the x and y coordinates at the maximum angle and so are related to standard distance.

The advantages of using mean centre and standard distance as aids to analyze oil office location may be summarized briefly as follows:

1. By means of a simple symbol, it is possible to represent cartographically the complex pattern of a large number of oil offices;
2. The symbol can be shown on a map in conjunction with the actual point distribution of any type of oil office under consideration and so provide a quick, clear summary;
3. The problem of comparing and contrasting large and wide distributions of oil offices is greatly simplified. Comparison can be made quickly and easily within and among oil office types.
4. A number of distributions can be shown in summary form on the same map and can be easily identified and comprehended;
5. Distributions of oil offices for each of the five data years can be plotted in summary form on the same map. It should thus be possible to readily trace shifts in dispersion and location and to identify trends.



Geostatistical parameters such as mean centre and standard distance are not without limitations. Isard<sup>21</sup> points out that by their very nature they cannot be used to examine the causes and effects of the differences observed within and between distributions. Rather they are just methods that indicate whether or not differences exist between distributions. If differences do exist these parameters only indicate the magnitude of these differences. As such they should be considered not as ends but rather as aids in the analysis of land use.

Another limitation on the application of geostatistical methods of location and dispersion to urban studies should be noted. Shachar points out that "these methods are best suited to nodal distributions: i.e., those having one core with a periphery. .. Calculating the centers of the standard distance for a dichotomic distribution (or more than two) could be misleading".<sup>22</sup>

After studying the computer print-outs of the different oil office types it was decided to use the geostatistical aids only in the analysis of the oil office patterns of the central area of each city.

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<sup>21</sup>W. Isard, Methods of Regional Analysis: An Introduction to Regional Science, New York, Technology Press of M.I.T. and John Wiley & Sons, 1960, p. 270.

<sup>22</sup>A. Shachar, "Some Applications of Geo-Statistical Methods in Urban Research," Papers, Regional Science Association, Vol. 18, 1967, p. 204.



## SUMMARY

In the first part of this chapter oil offices and the two groups--administrative offices and operations offices--were fully defined and described and the specific types within each of the two groups was outlined. Next the study areas were defined. This was followed by a detailed description of the sources of data and information of which the two most important were the Canadian Oil Registers and the personal interviews. The final part dealt with the processing of the data, the mapping of the spatial patterns of the oil office types and the use of some geostatistical aids to facilitate analysis of the location patterns.

The next chapter will concern itself with Calgary and Edmonton as oil office centres in Canada.



### CHAPTER III

#### CALGARY AND EDMONTON AS OIL CENTRES IN CANADA

To understand Calgary and Edmonton as oil office cities, it is desirable to briefly outline their origin and functional development and to examine their historical growth as oil centres. Both were well established centres by the time that any significant oil activity was introduced to them, although Calgary's introduction occurred some thirty years before Edmonton's. This chapter will also show the impact that the petroleum industry has had upon them and describe their importance as head office centres for the Canadian oil and natural gas industry.

#### THE ORIGIN AND FUNCTIONAL DEVELOPMENT OF CALGARY AND EDMONTON

##### The Origin and Functional Development of Calgary

Calgary began in 1875 as a Royal North-West Mounted Police fort at the junction of the Bow and Elbow Rivers in Southern Alberta. Shortly after its establishment the old Whoop-Up supply trail from Fort Benton, Montana, to Fort Whoop-Up near present day Lethbridge was extended to Calgary. Development at first was slow because of its location in a sparsely settled region. However, cattle ranching was



gradually being introduced from the United States. Impetus to settlement came with the railroad which reached Calgary in 1883 and by 1884 Calgary was a community of 500 persons.<sup>1</sup> The development of irrigation farming in Southern Alberta by Mormons from Utah after the late 1880s, and the establishment of the Canadian Pacific Railway irrigation district east of the city in 1904 further stimulated Calgary's development. Growth was very rapid during the first decade of the century as Calgary had become the main service centre for the ranching and farming region of Southern Alberta. Also, it had become the focus of a radiating network of railways. Thus Smith points out that "by 1911 Calgary was firmly rooted in its two major functions--transportation and regional service--and these were to form the city's unchallenged mainstays for the next 35 years".<sup>2</sup> However, he adds that "One important modification was made to Calgary's economic base between 1911 and 1946 with the introduction of the petroleum industry".<sup>3</sup> The discovery of oil and gas at Turner Valley in 1914 gave birth to Calgary's function as an oil centre. The 1947 Leduc

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<sup>1</sup>For a complete account of the early history of Calgary up to the turn of the century see E. H. Bussard, Early History of Calgary. Unpublished M.A. thesis, Dept. of History, University of Alberta, 1935.

<sup>2</sup>P. J. Smith, Change in a Youthful City: Calgary, Alberta. Edmonton, Department of Geography, University of Alberta, 1965, p. 5. (Mimeographed).

<sup>3</sup>Loc. cit.



and succeeding oil discoveries in Alberta rapidly transformed Calgary into one of Canada's two major oil office centres.

### The Origin and Functional Development of Edmonton

Edmonton's beginning should probably be dated from 1808 when the Hudson's Bay Company and the North-West Company of Montreal built forts within the limits of the present city. In 1821 the two forts were merged and the Hudson's Bay Company name, Fort Edmonton was retained. Settlement in the immediate vicinity of the fort (located on the north side of the river), began during the 1870s and by 1880 the centre had a population of 300.<sup>4</sup> In 1891 the competing community of Strathcona on the south side of the river was reached by an extension of the Canadian Pacific Railway from Calgary. Strathcona was annexed by Edmonton in 1912. In 1905, Alberta became a province and Edmonton was chosen as the capital. In the same year a second railway, the Grand Trunk reached Edmonton. Railway expansion from 1905 to 1930 was accompanied by a rapid settlement of central Alberta. With the development of a mixed farming economy in the region Edmonton gained importance as a service centre. Its hinterland was also greatly expanded by the settlement of the Peace River country, about 280 miles northwest of Edmonton especially after the railway reached the area in 1914.

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<sup>4</sup>For a detailed account of the development of Edmonton see J. G. MacGregor, Edmonton: A History. Edmonton, M. G. Hurtig, 1967.



Because of its geographic situation, Edmonton had increasingly become important as a hub for the movement of supplies to the North by air, land, and water (Figure 3). The city is the major northern air supply terminal in Canada and is served by four airports--the Industrial, International, Cooking Lake, and the Namao military air base. From Edmonton the Alaska Highway leads north as well as the Mackenzie to Hay River and Yellowknife. Access to the North by railway is provided by the Northern Alberta-Great Slave Lake Railway to Pine Point and the Northern Alberta to Fort McMurray. Edmonton is also the distribution centre for the vast Mackenzie River shipping system to the Northwest Territories and the Arctic; supplies are moved by barge from Fort McMurray and Hay River.

Finally, Edmonton's proximity to the large oil and gas fields in its region and to oil activity in Northern Canada have since 1948 resulted in the city becoming a major oil centre.

#### THE DEVELOPMENT OF CALGARY AND EDMONTON AS OIL CENTRES

##### The Development of Calgary as an Oil Centre

Calgary's beginning as an oil centre may be dated from the first 15 years of the turn of the century. As early as 1902 a small quantity of oil was discovered at Waterton



# EDMONTON, GATEWAY TO THE NORTH

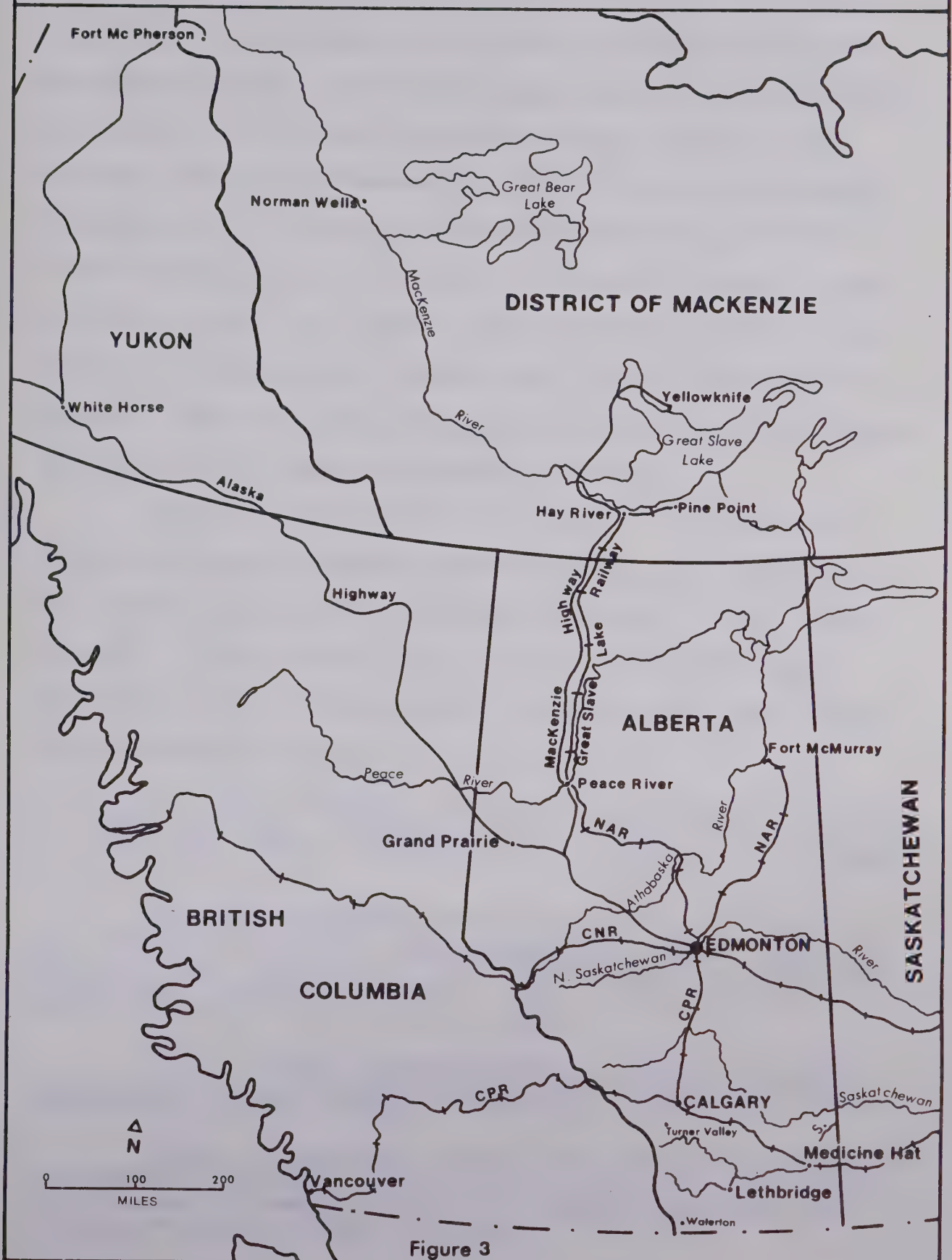


Figure 3



in the southwest corner of the province.<sup>5</sup> By 1904 natural gas from wells at Medicine Hat, 180 miles southeast of Calgary, was being utilized for heating, lighting and industrial uses. Additional discoveries of gas led to the founding of the Calgary Natural Gas Company in 1905 with stock sold mainly to Calgarians.<sup>6</sup> In 1910 this company and the Calgary Gas Company amalgamated with a new developmental company called the Prairie Fuel Gas Company, which was reorganized in 1911 as the Canadian Western Natural Gas, Light, Heat and Power Company. The new organization carried out a drilling program for gas but met only with moderate success.

The first significant discovery of oil was by the Calgary Petroleum Products Company which in 1914 discovered the Turner Valley field southwest of Calgary. Until Leduc in 1947, it was the main oil field in Alberta and Canada. The great impact of the Dingman<sup>7</sup> discovery well upon Calgary is well described by Hanson:

The boom that followed the Dingman discovery sent Calgary into a frenzy. Brokerage houses sprang up throughout the city and literally hundreds of oil companies were formed

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<sup>5</sup>G. Lonn, "Canadian Oil Pioneers," in J. D. Hilborn, ed., Dusters and Gushers, The Canadian Oil and Gas Industry. Toronto, Pitt, 1968, p. 27. Lonn states that the first producing well, completed in 1902, began flowing at 8,000 barrels a day from a depth of 1,020 feet.

<sup>6</sup>E. J. Hanson, Dynamic Decade: The Evolution and Effects of the Oil Industry in Alberta. Toronto, McClelland and Stewart, 1958, p. 42.

<sup>7</sup>The well was named after A. W. Dingman, a Calgary businessman who was in charge of drilling. A. W. Dingman together with William Elder and W. S. Herron had formed the Calgary Petroleum Products Company.



overnight. Most people with dollars in their pockets strove to get in on the ground floor and as much as half a million dollars changed hands in one day . . . The day after the Dingman well blew in the brokers abandoned their cash drawers and began piling the money into wastebaskets. Gaudily engraved share certificates were sold by the thousands. . .

Fortunes were made and lost regularly on the Calgary Stock Exchange but they were nothing to the millions that were thrown around by the "armchair drillers" in every pub and hotel lobby. Oil was the topic of conversation everywhere, even among the school children.<sup>8</sup>

The boom lasted but three months. Most of the many oil companies formed during the boom later exited from the business or became inactive. Table 1 shows the comparatively few companies in existence in 1920. Today, only the Turner Valley Oil Company, incorporated as an Alberta company in 1914, remains.

The Calgary Petroleum Products Company which survived the collapse of the boom was taken over in 1920 by the Royallite Oil Company, a subsidiary of Imperial Oil. Imperial Oil was incorporated in 1880 by a group of small Ontario refiners. In 1912 it had established a Marketing Divisional Office in Calgary.<sup>9</sup> Then in 1923 Imperial Oil began operating Alberta's first modern oil refinery in Calgary with Montana and Wyoming being the chief source of crude.<sup>10</sup>

Royalite's drilling of a successful well containing

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<sup>8</sup> Hanson, op. cit., p. 44-45

<sup>9</sup> Pers. comm. W. E. Smith, Regional Administrative Assistant, Imperial Oil Limited, Calgary, July, 1970.

<sup>10</sup> Telephone comm. Public Relations Department, Imperial Oil Limited, Edmonton, April 7, 1971. Turner Valley became the chief source of crude oil for the refinery after 1936.



TABLE 1 - OIL OFFICES IN CALGARY AND EDMONTON  
PRIOR TO 1947

Oil Office Types	1920		1925		1930		1935		1940		1945	
	Calg.	Edm.	Calg.	Edm.	Calg.	Edm.	Calg.	Edm.	Calg.	Edm.	Calg.	Edm.
Oil Companies (Producers, Explorers, Developers)	13	-	23	2	56	4	37	4	56	5	62	7
Geologists, Geophysicists	-	-	-	-	4	0	2	-	3	-	4	-
Oil and Mining Stocks	7	-	-	-	31	1*	19	-	19	-	11*	3*
Oil Exchanges	-	-	-	-	2	-	1	-	-	-	-	-
Oil Brokers and Land Agents	-	-	-	2	75	-	15	-	21	-	11	-
Oil and Gas Well Supply, Equipment, and Service	-	-	-	3	13	2	6	1	15	1	17	-
Oil Well Drillers	1	-	-	-	8	1	1	-	5	-	14	-
Oil Pipe Lines	-	-	-	-	-	-	-	-	1	-	1	-
Natural Gas Companies	3	-	2	1	2	1	2	1	2	1	3	1
Refiners, Distributors	2	-	2	2	2	3	4	9	6	11	4	11
Oilwell Transportation	-	-	-	-	5	-	5	-	8	-	1	-
Total	26	-	27	10	198	12	92	15	136	18	128	22

\* Listed as Stocks and Bonds

Source: Alberta Government Telephones, Telephone Directories for Calgary and Edmonton.

A careful and thorough search was made of the Directories to obtain the number of all types of companies associated with the petroleum industry. They were then grouped into the types shown in the table. It is believed that the Directories are highly reliable and that most companies actively involved with the industry would be listed.



very light oil and wet gas in 1924 resulted in a renewed burst of drilling activity. Hanson states that the "coming in of the well set off a chain reaction of drilling and dozens of rigs churned up the rolling countryside. More than two hundred wells were drilled the next 12 years, mainly for naphtha recovery."<sup>11</sup> Again Calgary derived the benefits of the activity. The number of oil companies (Producers, Explorers, Developers) rose from 13 in 1920 to 23 in 1925 and to 56 in 1930 (Table 1). The 1930 Calgary telephone directory lists a total of 198 various companies associated with the petroleum industry. The failure to find the main pool of oil led to a slowdown in activity and is reflected in the decline in various oil companies in Calgary by 1935 (Table 1).

It was not until 1936 that the major oil pool of the Turner Valley field was penetrated. Three Calgary businessmen, R. A. Brown, Superintendent of the Calgary Electric Light and Power Department, G. M. Bell a Calgary newspaper owner, and J. M. Moyer, pooled their life savings, and with contributions from Imperial Oil and the British American Oil Company, drilled the discovery well. Drilling activity again was great and by 1942 oil companies had brought in nearly 200 wells.<sup>12</sup> Table 1 shows the renewed rise in oil offices for Calgary by 1940.

In order to avoid overproduction and consequent waste

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<sup>11</sup>Hanson, op. cit., p. 47.

<sup>12</sup>Ibid., p. 49.



of oil in the Turner Valley field, Imperial Oil, operator of the only Calgary refinery, set up a system of quotas (termed prorationing<sup>13</sup>) to be purchased from producers. The producers, many of them small independent companies, objected to having a major firm restrict their production. To deal with the situation, the Alberta Government set up the Petroleum and Natural Gas Conservation Board in 1939 with headquarters in Calgary to allocate quotas and to regulate oil and gas production in the interests of conservation. By choosing Calgary as the head-quarters for the Board, the government gave recognition to Calgary's role as the centre of the petroleum industry at that time.

Besides Turner Valley, some 17 other oil fields,<sup>14</sup> most of small importance, and the majority located in the

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<sup>13</sup>Prorationing in simplest terms is just a system of regulating oil production. In 1938 the Alberta Government set up a Conservation Board to regulate the output of each producer and of each of his wells.

The way in which prorationing now works is well outlined by Gray as follows:

Refiners wishing to purchase Alberta oil must nominate each month with the Conservation Board for the amount of oil they require. The total of these nominations represents the market demand for any particular month. The market demand is then prorated among the province's oil fields in proportion to the estimated recoverable oil reserves for each field. In similar fashion, the resulting total for each field is prorated among the wells within that field. . . .

Under Alberta's prorationing plan, the share of the market demand which any producer receives is not dependent upon the number of oil wells which he owns, but upon the estimate of his recoverable oil reserves. E. Gray, Impact of Oil. Toronto, The Ryerson Press and Maclean-Hunter Limited, 1969, pp.33-34.

<sup>14</sup>Hanson, op. cit., p. 52.



Calgary region, were discovered prior to 1947 (Figure 4). One field of considerable significance was Jumping Pound discovered by the Shell Oil Company about 20 miles west of Calgary. Although it has been capable of producing only some light oil, its real importance is its great gas potential which is being utilized by the city of Calgary.

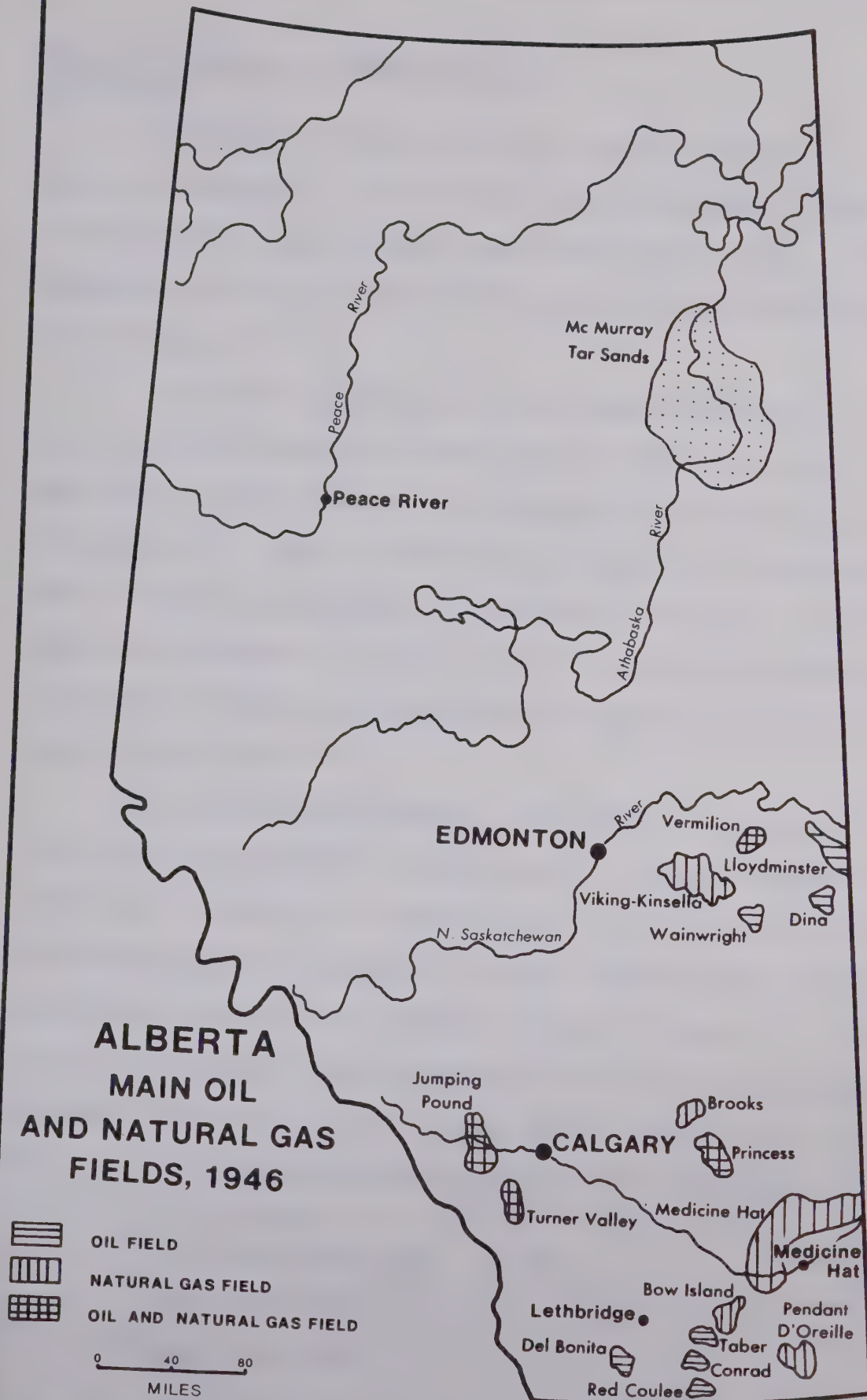
Prior to 1947, natural gas fields were predominantly concentrated in Southern Alberta (Figure 4). Of significance is the fact that as late as 1956, Southern Alberta had nearly half of the natural gas reserves of the province which included the four leading fields of Pincher Creek, Medicine Hat, Cessford, and Harmattan-Elkton, all in excess of one trillion cubic feet.<sup>15</sup>

The concentration of most exploration activity prior to 1947 in Southern Alberta led to the gradual development in Calgary of the head and branch offices of a variety of administrative and operations petroleum firms. They desired the amenities and needed the services which a major centre can provide. Moreover, in 1939, Calgary obtained Alberta's second refinery with the opening of the British American Oil Company refinery. Then in 1940, the first ammonia and ammonium nitrate factory based on natural gas was built in Calgary. All of the aforementioned developments from 1902 to 1947 made Calgary an active petroleum centre before the Leduc discovery (Table 1).

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<sup>15</sup> Ibid., p. 231.





Source: E. Hanson, *Dynamic Decade*

Figure 4



## The Development of Edmonton as an Oil Centre

Edmonton's start as an oil centre was late in comparison with Calgary's. It was the Leduc discovery in 1947 which initiated the city's development as an oil centre. However, Edmonton felt the influence of some petroleum activity prior to that date.

In 1907, the North West Oil and Gas Company of Edmonton, motivated because of the Medicine Hat gas finds, drilled two wells within the city in a search for natural gas but had no success.<sup>16</sup> Then in 1914 a major gas field was discovered some 70 miles south-east of Edmonton at Viking. In 1923 Edmonton received its first natural gas when Northwestern Utilities of Edmonton constructed a pipeline from the Viking field to the city.<sup>17</sup>

A flurry of excitement was created in Edmonton in 1920 with the discovery by Imperial Oil of the Norman Wells oil field (Figure 3). Although some 1000 miles away from Edmonton along the Mackenzie River, nevertheless Edmontonians took great pride in it "because it was in their . . . Northland".<sup>18</sup> Edmonton was the staging point for the movement of equipment and supplies to Norman Wells. Before 1940 oil production at Norman Wells was limited with an average of only

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<sup>16</sup>MacGregor, op. cit., p. 164.

<sup>17</sup>Ibid., p. 232.

<sup>18</sup>Ibid., p. 229.



100 barrels per day.<sup>19</sup> Distance from markets was a major handicap to development of the oil field. However, with the need for petroleum products in the North, particularly Alaska, during the Second World War, the Canadian and American Governments cooperated to build a 600-mile pipeline from Norman Wells to Whitehorse, Yukon. The Alaska Highway also was built at this time. Edmonton, as the gateway to the North, again became the focal point for the assembling and movement north of equipment as well as American civilian and military personnel for these engineering projects.

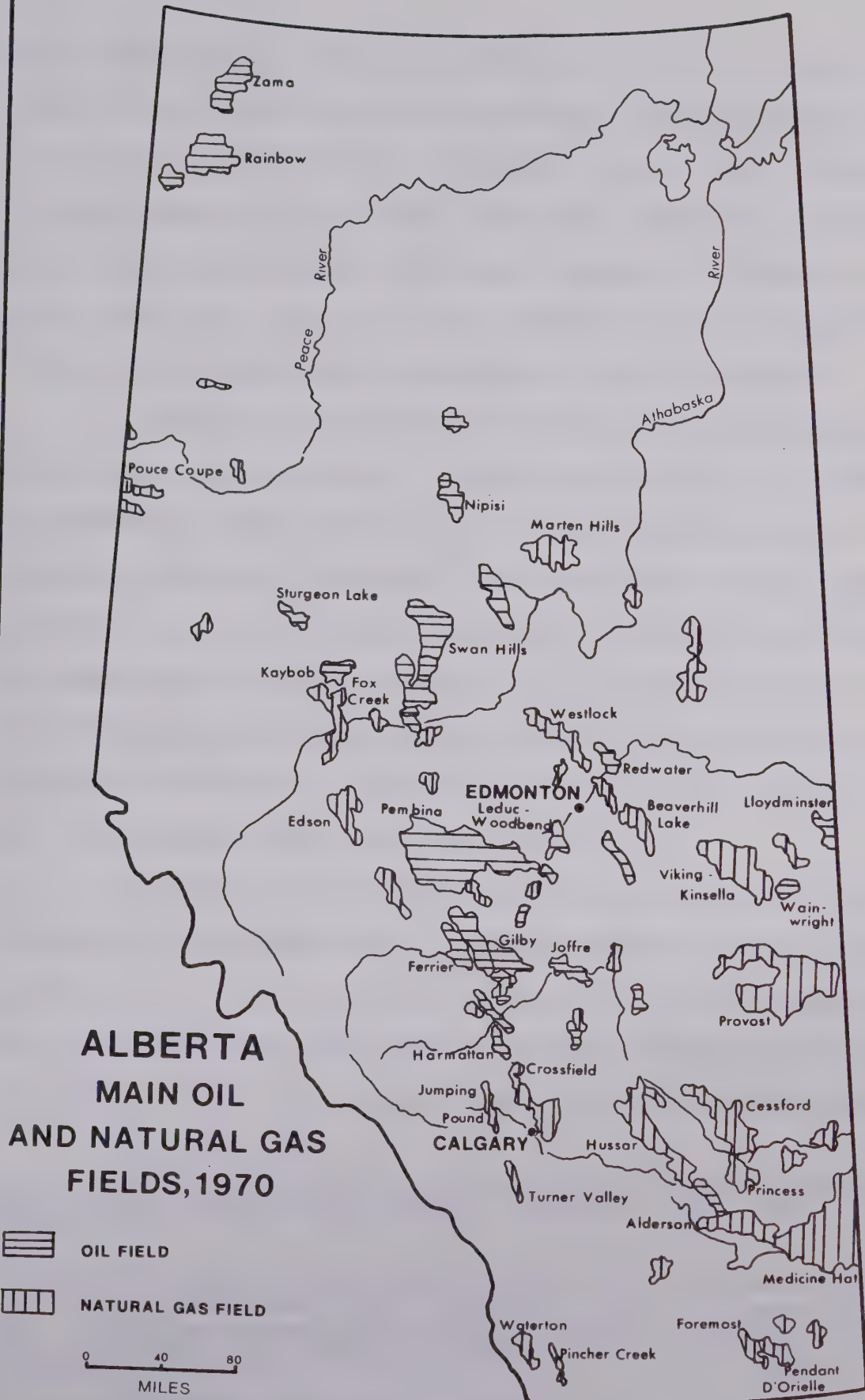
Some oil was found in the Edmonton region at Wainright in 1925, and Vermilion in 1939, both about 150 miles east of Edmonton. Also discovered in 1939 was the Lloydminster oil field which is 25 miles east of Vermilion (Figure 4). The oil of these three fields is a heavy crude with a high asphaltic content so had a small market until the 1950s when it was processed for diesel fuel and asphalt. All of the aforementioned developments apparently had little influence upon the establishment of oil offices in Edmonton. Table 4 shows that relatively few oil firms were located in Edmonton prior to 1947.

The oil and gas discoveries in the Edmonton region and in the areas to the north after 1946 (Figure 5) rapidly

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<sup>19</sup>E. Gray, Impact of Oil. Toronto, The Ryerson Press and Maclean-Hunter Ltd., 1969, p. 12.





Source: Alberta Government, Department of Mines and Minerals, Alberta Oil and Gas Picture, 1969

Figure 5



and dramatically transformed Edmonton into a major oil centre. Many activities directly and indirectly related to the petroleum industry established themselves in the city. These include ones such as oilwell drilling companies, oilfield equipment, supplies and servicing companies, oilfield transport firms, oil and natural gas pipeline companies, petroleum consultants, engineers, surveyors as well as others.

Within a very short time Edmonton was surrounded by major oil and gas fields. It had been stated that there are approximately 7000 producing oil wells operating within a 100 mile radius of Edmonton<sup>20</sup> and that about 70 per cent of Alberta's total petroleum production occurs within a radius of less than 100 miles of the city.<sup>21</sup> Hanson reports that in 1956 Central Alberta had more than two-fifths of the natural gas reserves of the province but no fields with reserves in excess of one trillion cubic feet.<sup>22</sup>

The many oil and gas discoveries rapidly led to Edmonton's development as a notable refining and petrochemical centre. The first refinery was opened in 1948 by Imperial Oil. In 1951, two additional ones were completed, one by the British American Oil Company (now Gulf Oil) and the other by

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<sup>20</sup>City of Edmonton, Industrial Development Department, New Trends and Research Report. Edmonton, City Hall, 1971, Section V.

<sup>21</sup>K. Lenz, "Large Urban Places in the Prairie Provinces--Their Development and Location," in R. L. Gentilcore, ed., Canada's Changing Geography. Toronto, Prentice-Hall, 1967, p. 206.

<sup>22</sup>Hanson, op. cit., p. 231.



the McColl Frontenac Company. In 1969 the Gulf Oil Company began construction of a refinery, the largest in Western Canada, which is scheduled for completion in 1971.<sup>23</sup>

In 1953 Edmonton obtained the second largest petrochemical plant in Canada at that time, built by the Canadian Chemical Company at a cost of \$70 million to produce organic chemicals, textile yarns, cellulose and acetate using natural gas as one basic raw material.<sup>24</sup> Also, the same year Canadian Industries Limited constructed a \$15 million polyethelene plant.<sup>25</sup> Eighteen miles northeast of the city the Sherriitt Gordon Mines Ltd. erected a \$25 million plant using natural gas to refine nickel concentrates.<sup>26</sup> The above three plants together with seven additional ones built in the succeeding years represent an investment of half a billion dollars in plants.<sup>27</sup>

Edmonton has become the centre of approximately 10,000 miles of major oil and gas transmission pipelines which radiate out from the city, exclusive of hundreds of

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<sup>23</sup>The new refinery will replace the existing one (formerly the British American Oil Company refinery completed in 1951).

<sup>24</sup>Hanson, op. cit., p. 215.

<sup>25</sup>Ibid., p. 217.

<sup>26</sup>W. C. Wonders, "Repercussions of War and Oil on Edmonton, Alberta." *Cahiers de Geographie de Quebec*. 3e Annee, (6), 1959, p. 348.

<sup>27</sup>City of Edmonton, Public Relations Division, Edmonton 1970. Edmonton, City Hall, p. 4. (Mimeographed)



miles of field gathering lines<sup>28</sup> (Figure 6). On its eastern outskirts are the terminals of Canada's two major oil pipelines--the Interprovincial to Port Credit, Ontario and the Trans Mountain to Vancouver, B.C.

### Summary

Calgary had an early start as an oil centre. Three significant periods of oil discovery in the Turner Valley field--in 1914, 1924, and 1936--, and the concentration of most exploration activity prior to 1947 in Southern Alberta resulted in Calgary early becoming a centre for oil activity and with oil experience. Edmonton, on the other hand, up to 1947 showed little evidence of development as an oil centre. Some natural gas and low-grade crude oil was discovered in its region but the discoveries had little impact upon the city.

The oil discoveries which sparked the remarkable development of both cities as oil centres were the ones made after 1947. Rapidly both cities emerged as Canada's two leading oil cities. The impact that these discoveries after 1947 had upon Calgary and Edmonton will be examined next.

## THE IMPACT OF THE OIL INDUSTRY ON ALBERTA AND ON CALGARY AND EDMONTON

### Alberta As An Oil Producing Region

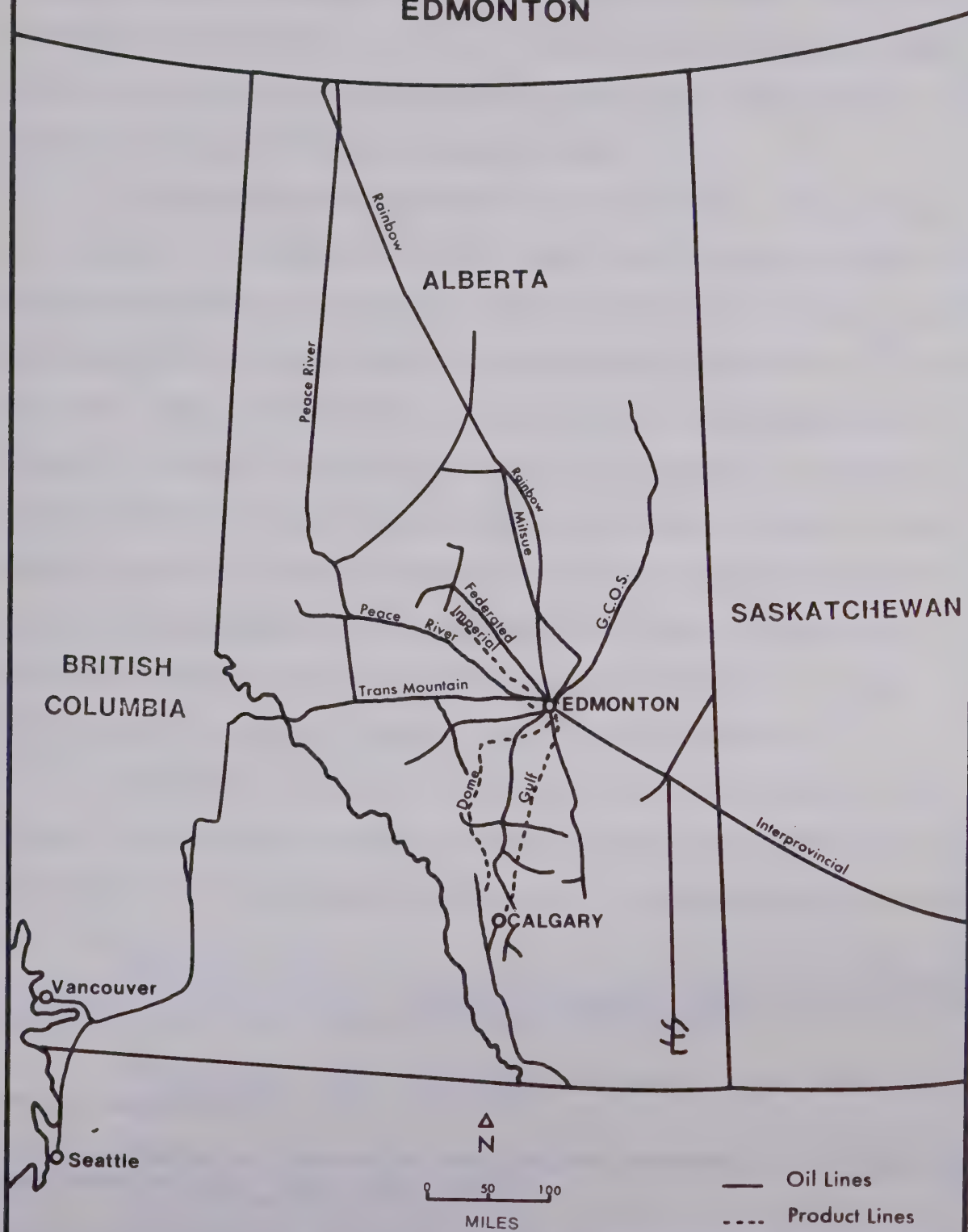
Most oil is found in the sedimentary rock areas of

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<sup>28</sup>City of Edmonton, Industrial Development Department,  
op. cit., Section V.



# OIL AND OIL PRODUCT PIPE LINES CENTERING ON EDMONTON



Source: Oilweek, McLean-Hunter  
Publication, Nov. 24, 1969

Figure 6



the earth. Nearly all of Alberta lies within the Great Sedimentary Basin of Canada and has a large petroleum potential. Indeed, the majority of the oil and gas that has been found to date has been in Alberta and Calgary and Edmonton lie within the heart of these discoveries.

The importance of Alberta as the major oil province of Canada is illustrated by the fact that in 1968 it had 88 per cent of the recoverable crude oil reserves in Canada and accounted for 67 per cent of Canadian oil production.<sup>29</sup> In the same year it had about 60 per cent of the producing oil wells in Canada<sup>30</sup>. Alberta also is the leader in natural gas reserves and production with nearly four-fifths of the total output in 1968.<sup>31</sup> Alberta's leading position is further substantiated by the fact that in 1966, 72 per cent of the total amount spent by the petroleum industry on total activities in Western Canada, was spent in Alberta.<sup>32</sup>

Alberta has vast reserves of oil in the form of tar sands. The largest deposits occur in the Fort McMurray area some 300 miles northeast of Edmonton. Reserves are estimated

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<sup>29</sup> Alberta Government Bureau of Statistics, Department of Industry and Tourism, Alberta Industry and Resources, 1970 Edition. Edmonton, Queen's Printer, pp. 70-71.

<sup>30</sup> Telephone comm. Alberta Government, Department of Mines and Minerals, April 8, 1971.

<sup>31</sup> Alberta Bureau of Statistics, Department of Industry and Tourism, op. cit., pp. 70-71.

<sup>32</sup> City of Calgary, Industrial Development Department, Headlines Growth Highlights and Future Prospects, 1968-1969, Calgary, City Hall, p. 1.



to be 300 billion barrels which, exclusive of conventional reserves would be adequate to meet Canada's 1969 oil demand rate for about 700 years.<sup>33</sup> However, oil production from this source in the past has been limited because of the technical problems of separating the oil from the sand. These problems are being overcome.

In 1967, Great Canadian Oil Sands Limited opened a 45,000 barrel per day plant costing over \$250 million to extract synthetic crude from the McMurray oil sands. Production in 1970 averaged 32,740 barrels per day or 11,950,000 barrels for the year.<sup>34</sup> In addition, Syncrude Canada Limited in 1969 received permission from the Alberta Government to proceed with plans to have an 80,000 barrel per day extraction plant costing about \$300 million, in operation by 1976.<sup>35</sup>

#### The Impact of the Petroleum Industry on Alberta

The economic impact of the development of the oil and gas industry on Alberta after 1947 was dramatic. Throughout Alberta it created a psychological climate of boyancy and optimism. Hanson points out that between 1946 and 1964 the

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<sup>33</sup>Gray, op. cit., p. 48.

<sup>34</sup>Telephone comm. W. C. Blood, Assistant Comptroller, Great Canadian Oil Sands Limited, Edmonton, March 8, 1971.

<sup>35</sup>City of Edmonton, Industrial Development Department, op. cit., Section V.



population of the province increased by 78 per cent (the highest rate of growth experienced by any province in Canada), per capita income more than doubled, and the employment index rose 103 per cent, far ahead of the Canadian increase of 48 per cent.<sup>36</sup> He further states that had the petroleum industry not begun its rapid development, population and employment would have declined and that the average rate of increase of income per capita would have been substantially less.<sup>37</sup> Moreover the development of the petroleum industry has almost doubled the size of the Alberta economy since 1947.<sup>38</sup>

#### The Impact of the Petroleum Industry on Calgary and Edmonton

Although the effect of the petroleum industry was felt throughout Alberta, its impact was greatest on the cities of Calgary and Edmonton. Population of the two cities nearly quadrupled since 1946 from 100,044 to 385,436 for Calgary in 1970 and from 114,976 to 422,418 for Edmonton.<sup>39</sup> During the same time period companies directly involved with

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<sup>36</sup>E. J. Hanson, Regional Employment and Income Effects of the Petroleum Industry in Alberta. Paper presented to the Council of Economics, American Institute of Mining, Metallurgical and Petroleum Engineers Annual Conference, New York, March 2, 1966, p. 157.

<sup>37</sup>Ibid., pp. 156-157.

<sup>38</sup>Loc. cit.

<sup>39</sup>The 1946 population figures are from: Calgary Power Limited, Alberta Province of Opportunity: A Survey of Resources and Economic Possibilities. Calgary, J. T. Donald and Company Limited, 1958; the 1970 figures are from Alberta Government, Department of Municipal Affairs, Within Our Borders. August, 1970, p. 2.



the various aspects of the petroleum industry multiplied greatly from about 133 to 1,802 for Calgary and from 27 to 830 for Edmonton.<sup>40</sup> The growth of various head and branch oil offices was great in the two cities. In 1969-70 Calgary had 1,362 head offices and 516 branch offices while Edmonton had 480 and 377 respectively.<sup>41</sup>

For Calgary in 1967, the petroleum industry provided employment for 11,700 persons or 9 per cent of the city's labour force with annual salary of over \$70 million.<sup>42</sup> According to the City of Calgary Planning Department, it is believed that more than 50 per cent of the city's total employment is derived from the needs of the oil industry and its employees.<sup>43</sup> Also it has been estimated that for every additional 100 people employed in the industry 294 will be required in other fields.<sup>44</sup>

The impact of the petroleum industry is possibly

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<sup>40</sup> The 1946 figures are from the 1946 Alberta Government Telephone Directory for Calgary and for Edmonton and the 1970 figures from Nickle's Canadian Oil Register, 1969-70. Calgary: C. O. Nickle Publishing Company.

<sup>41</sup> Nickle's Canadian Oil Register, 1969-70. Calgary, C. O. Nickle Publishing Company.

<sup>42</sup> City of Calgary, Industrial Development Department, Do You Know What the Petroleum and Natural Gas Industry Means To the City of Calgary? Calgary, 1967. (Mimeographed)

<sup>43</sup> City of Calgary, Planning Department, Future Labour Force, Calgary, 1966-1986. Calgary Metropolitan Area Environmental and Transportation Study, 1966, p. 12.

<sup>44</sup> City of Calgary, Industrial Development Department, Do You Know What the Petroleum and Natural Gas Industry Means To the City of Calgary? op. cit.



nowhere more strongly reflected than in the construction of new office buildings, most notably in Calgary's downtown. By the beginning of 1968, major new office buildings, directly or indirectly connected with oil and gas, were completed or announced for downtown Calgary with total expenditure of \$128 million.<sup>45</sup> The total square footage in these structures was in excess of 4 million.<sup>46</sup> In the autumn of 1970 construction began on a spectacular \$50 million four-tower office development, Bow Valley Square. When completed it will be the largest in Calgary with 1.4 million square feet of useable space, most of which will be office facilities.<sup>47</sup>

In both Calgary and Edmonton many new industries were created to manufacture equipment and supplies for the petroleum industry. Manufactured are parts and equipment for oil and gas wells, drilling rigs, gas plants, storage tanks as well as portable camp facilities and steel and plastic pipe for oil and gas lines.

Edmonton has become a highly important refining and petrochemical centre. Upon the completion of Gulf Oil's new 80,000 barrel per day refinery in 1971, Edmonton will have a total refining capacity of 129,000 barrels of crude

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<sup>45</sup> Calgary, Industrial Development Department, Headlines Growth Highlights and Future Prospects, 1968-1969. Op. cit., p. 2.

<sup>46</sup> Loc. cit.

<sup>47</sup> "Bow Valley Square: Transforming Calgary's Face." Alberta Business Journal, Vol. 4 (September, 1970), pp. 52-54.



oil per day.<sup>48</sup> This represents 77 per cent of the total refining capacity in Alberta and 33 per cent of the total refining capacity in Western Canada.<sup>49</sup> Also scheduled for completion in 1971 is the Alberta Prairie Products Pipe Line which will move gasoline, diesel fuels and jet fuel to the Calgary market from Edmonton's Gulf Oil refinery initially but also eventually from the Imperial Oil and Texaco refineries.<sup>50</sup> Edmonton also has a significant petrochemical industry with 10 plants operating within its immediate region in 1970.<sup>51</sup> These developments surely are outstanding considering that previous to 1947 Edmonton had no refineries or petrochemical plants.

#### HEAD OIL OFFICES IN CALGARY, EDMONTON AND THE REST OF CANADA

One indicator of the importance of a city as an oil centre is the concentration of head offices.<sup>52</sup> The head office represents a company's seat of authority and is the

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<sup>48</sup>City of Edmonton, Industrial Development Department, op. cit., Section V, p. 1.

<sup>49</sup>Loc. cit.

<sup>50</sup>Telephone comm. Mr. H. Berg, Project Engineer, Gulf Oil Canada Limited, Edmonton, April 7, 1971.

<sup>51</sup>City of Edmonton Industrial Development Department, op. cit., Section V, p. 2.

<sup>52</sup>The head office is defined as the home or regional office of an oil firm at which the officers, directors or owners, i.e., the decision-makers, are located.



place from which its activities are directed at the international, national, regional or local level. Therefore, the top decision makers of a company usually are located at the head office.

Calgary and Edmonton together contain a high proportion of the total head oil offices in Canada. Figure 7a shows that from 1950-51 to 1969-70 the two cities consistently had two-thirds of the total in Canada. From 1950 to 1970 the number of head oil offices in the two cities nearly tripled from 652 to 1,842 (Table 2). Very significant is the fact that Calgary has been a remarkably strong head oil office city with nearly one-half of the Canadian total throughout the twenty years. On the other hand Edmonton has had about one-fifth of the Canadian total (Figure 7b).

The marked concentration of head offices of oil and gas companies in Calgary and Edmonton, indeed, reflects Alberta's role as the leading petroleum province in Canada.

#### Head Offices: Oil Administrative Group

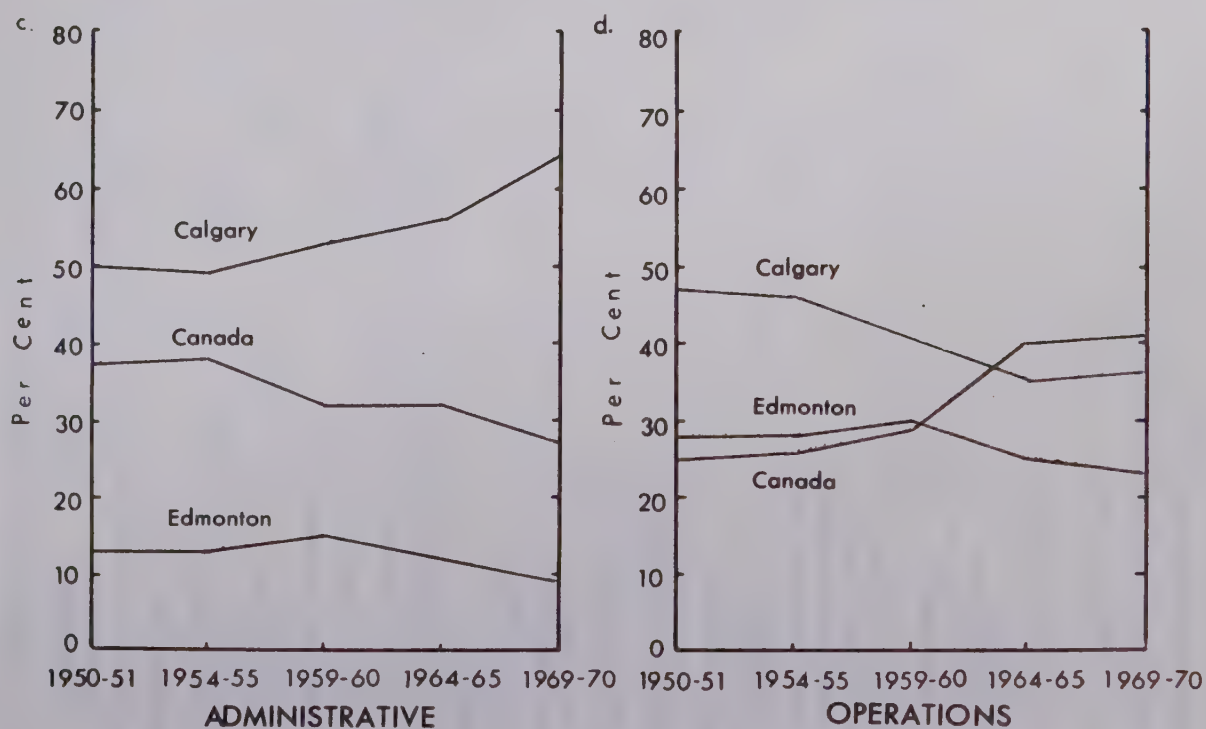
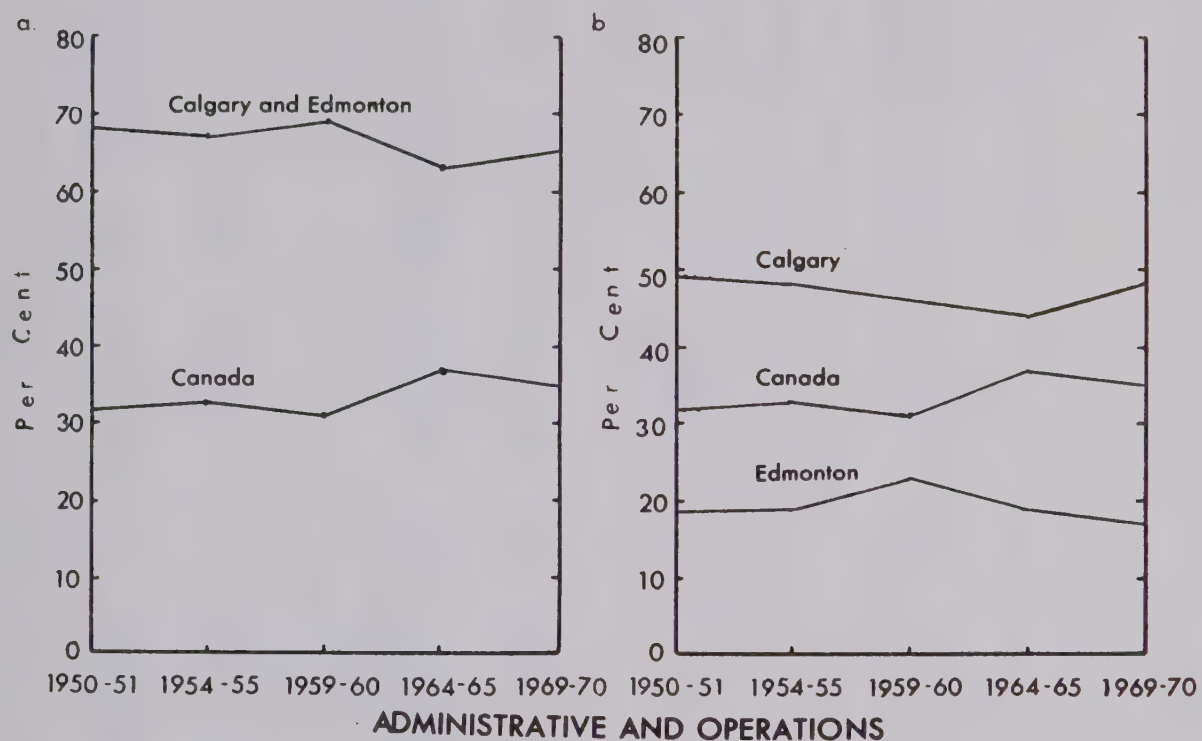
Calgary occupies a position of increasing prominence as a head office centre for the administrative group of firms in Canada. Figure 7c shows that in 1950-51 it had 50 per cent of the Canadian total and that by 1969-70 it had increased its lead to 65 per cent. A marked increase occurred during the last five years.

Edmonton is considerably less important than Calgary as a head office centre for the administrative group of firms.



# HEAD OIL OFFICES IN CALGARY, EDMONTON, AND THE REST OF CANADA, 1950-1970

(By Percentage of Total in Canada)



Source: Nickle's Canadian Oil Register

Figure 7



TABLE 2 - HEAD OIL OFFICES IN CALGARY, EDMONTON, AND THE REST OF CANADA

Oil Office Group and Types	1950-51			1954-55			1959-60			1964-65			1969-70																	
	Calg. No.	Edm. %	Can. %	Calg. No.	Edm. %	Can. %	Calg. No.	Edm. %	Can. %	Calg. No.	Edm. %	Can. %	Calg. No.	Edm. %	Can. %															
Administrative																														
Producers, Explorers, Developers	230	52	47	11	161	37	396	50	103	13	295	37	280	53	73	14	174	33	290	55	53	10	185	35	412	62	47	7	202	31
Consultants, Data Processors	25	63	13	32	2	5	38	69	8	15	9	16	88	66	24	18	21	16	146	66	39	18	37	16	286	73	47	12	61	15
Financial and Investment	18	32	1	2	38	66	12	19	4	6	47	75	17	24	6	8	50	68	21	25	3	4	61	71	21	27	2	3	56	70
Lease Brokers and Land Agents	9	37	10	42	5	21	13	68	5	26	1	6	19	58	10	30	4	12	37	74	8	16	5	10	55	81	5	7	8	12
Total Administrative	282	50	71	13	206	37	459	49	120	13	352	38	404	53	113	15	249	32	494	56	103	12	288	32	774	64	101	9	327	27
Operations																														
Service and Supply	92	45	61	30	52	25	122	41	95	32	83	27	185	33	196	35	184	32	227	31	199	27	313	42	286	32	233	25	396	43
Oilwell Drilling Contractors	20	44	17	38	8	18	33	51	24	37	8	12	41	65	15	24	7	11	31	69	9	20	5	11	36	71	10	20	5	9
Engineers, Designers, Con- structors, Fabricators	-	-	-	-	-	-	-	-	-	-	-	-	15	37	12	29	14	34	29	26	21	19	62	55	44	34	28	22	57	44
Geophysical & Exploration Drilling Contractors	59	53	28	25	24	22	94	62	29	19	28	19	91	64	23	16	28	20	69	66	11	10	25	24	77	69	6	5	29	26
Oilwell Servicing	-	-	-	-	-	-	6	32	11	58	2	10	23	37	32	51	8	12	26	43	22	37	12	20	24	35	22	32	23	33
Pipeline Companies and Power Distributors	5	36	6	43	3	21	10	50	5	25	5	25	28	47	8	14	23	39	48	55	11	13	29	32	54	58	9	10	30	32
Refiners, Processors, Mar- keters, Plant Operators	10	45	1	5	11	50	7	22	1	3	24	75	17	34	8	16	25	50	23	39	5	8	31	53	37	48	3	4	37	48
Transportation and Oil- field Construction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	14	49	39	59	47	30	15	68	33	107	52
Total Operations	186	47	113	28	98	25	272	46	165	28	150	26	400	41	294	30	289	29	471	35	327	25	536	40	588	36	379	23	684	41
Total Administrative and Operations	468	49	184	19	304	32	731	48	285	19	502	33	804	46	407	23	538	31	965	44	430	19	824	37	1362	48	480	17	1011	35

<sup>1</sup> Can. designates the number of head offices in the rest of Canada, i.e. outside of Calgary and Edmonton.

Source: Nickle's Canadian Oil Register.



Figure 7c shows that, for the five time periods, it had an average of about 13 per cent of the Canadian total which for one city is still significant. Edmonton actually experienced a slow decline in its proportion of head administrative group offices since 1959-60.

A gradual percentage decline is also noted for this group of head offices in Canada outside of Calgary and Edmonton. In other words, Calgary is growing in importance as a head office centre for oil and gas companies of the administrative group at the expense of Edmonton and the rest of Canada.

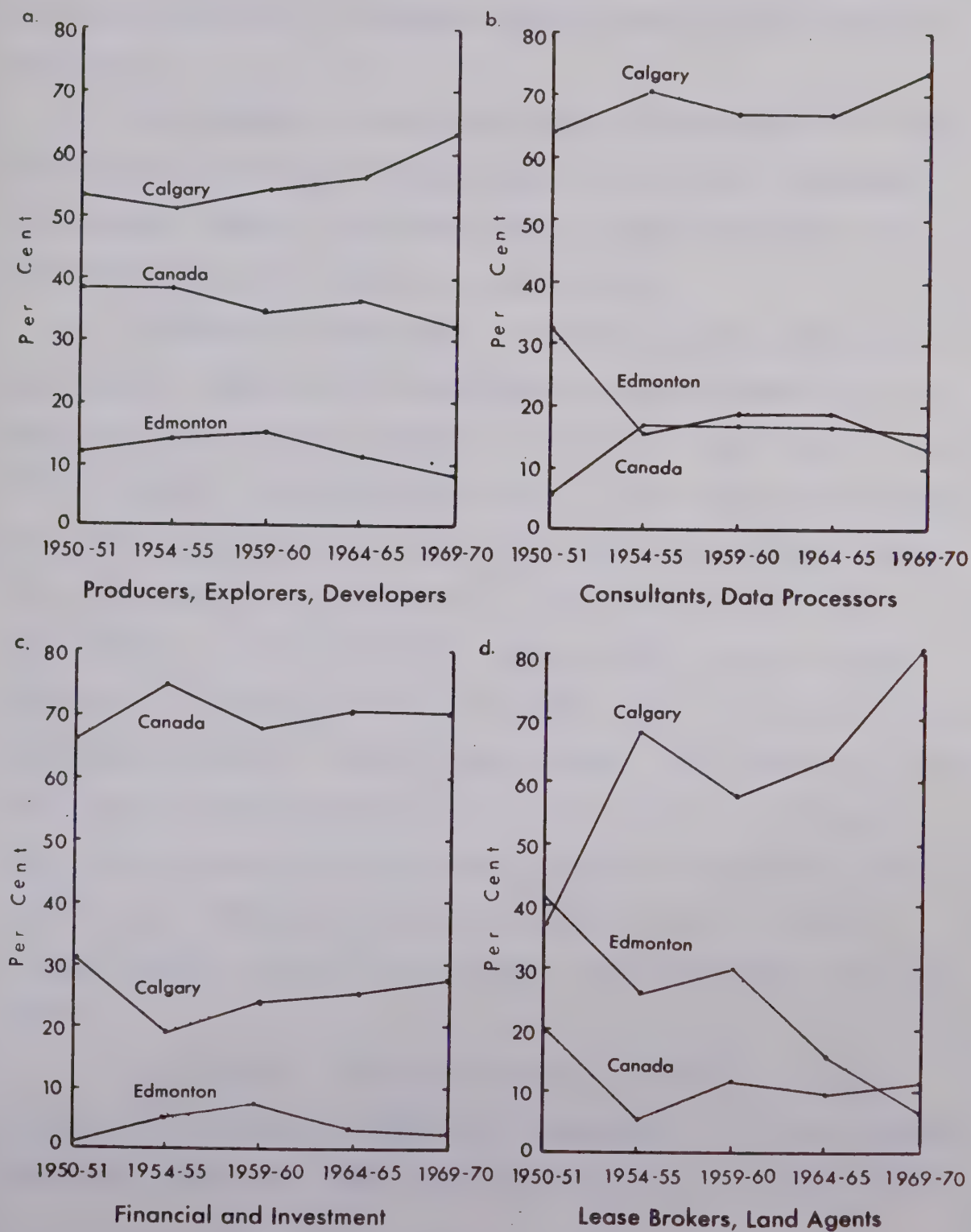
A glance at the graphs which show the development of the specific types of head oil offices within the administrative group (Figure 8 a-d) reveals that Calgary dominated as a head office centre for Producers, Explorers, Developers, for Consultants-geological, geophysical, engineering, surveying-and Data Processors, and for Lease Brokers and Land Agents. Very remarkable is the head office development of Lease Brokers and Land Agents in Calgary with a growth from 37 per cent of the Canadian total in 1950-51 to 81 per cent in 1969-70; also to be noted is the sharp decline in percentage points for this type in Edmonton.

Head Financial and Investment offices related to the petroleum industry were most highly concentrated during the study period outside of Calgary and Edmonton. However, Calgary had nearly one-half as many as the total number in



# HEAD ADMINISTRATIVE OIL OFFICES IN CALGARY, EDMONTON, AND THE REST OF CANADA, 1950-1970

(By Percentage of Total in Canada)



Source: Nickle's Canadian Oil Register

Figure 8



the rest of Canada. Calgary is the financial centre for Alberta and in particular for the petroleum industry. Four of the five major Canadian banks in Calgary have special oil and gas departments to serve the needs of the oil and gas industry.

Of interest is the fact that of the head offices of the Financial and Investment type of firms not in Calgary or Edmonton during the twenty years, about one-half were located in Toronto (Table 1, Appendix A).

Producers, Explorers, Developers, numerically, are the largest type of the administrative group (Table 2). Edmonton recorded its greatest increase of this type of head office during the first four years of the study period when they grew from 47 to 103 (120 per cent); thereafter, there was a decline to 43 in 1969-70. The marked growth during the 1950-51 to 1954-55 period corresponds with the early post-war oil boom years when the major oil discoveries (Leduc-Woodbend, Redwater, Pembina) were made in the Edmonton region. There was a rapid development of oil companies in Alberta many of them small and presumably some located their total activities, including the head office, close to the oil fields. More will be stated about this development in Chapter V.

In Calgary, a marked increase in number of head offices of Producers, Explorers, Developers, occurred during two time intervals. The greatest development, from 1950-51



to 1954-55 (Table 2), corresponds with the early part of the recent oil boom when they grew from 230 to 396, an increase of 72 per cent. The second marked increase took place between 1964-65 and 1969-70 when they multiplied from 290 to 412, a jump of 42 per cent.

In summary, throughout the twenty-year study period Calgary and Edmonton have been the location of from 62 to 73 per cent of the head offices of the administrative group of firms. However, Calgary had the greatest share of these by far and is, indeed, the outstanding Canadian head office centre for the administrative group of oil and gas offices.

#### Head Offices: Oil Operations Group

During the study period Calgary and Edmonton together recorded from 59 to 75 per cent of the head offices of the operations group of firms in Canada (Figure 7d). Throughout the twenty-year period Calgary held a leading position over Edmonton. Although both cities had a steady increase in the number of head operations offices from 1950-51 to 1969-70 (Table 2), nevertheless both had a decline relative to the number in the rest of Canada, particularly since 1959-60. In other words, expansion of this group of head oil offices was more rapid elsewhere in Canada than in Calgary and Edmonton, and most pronounced in the five years after 1959-60. From 1964-65 this rise levelled off. Calgary experienced a slight rise from 1964-65 to 1969-70. Figure 7d shows that



Edmonton expanded its share of head operations offices during the first ten years of the study period which was the time of discovery of the major oil fields in Central Alberta.

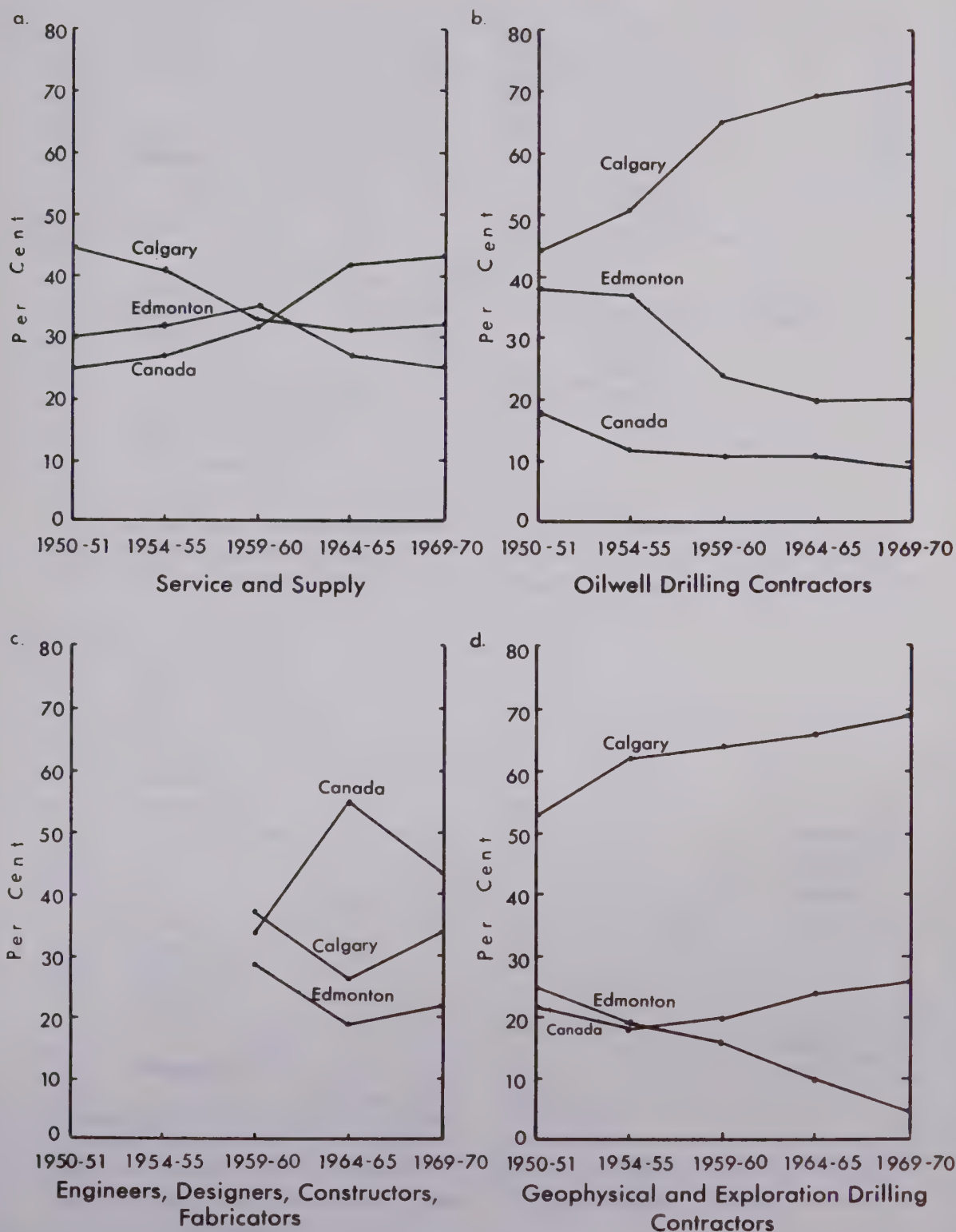
The largest type numerically, of head oil offices of the operations group is Service and Supply which for the study period was close to one-half of the Canadian total throughout (Figure 9a and Table 2). Both Calgary and Edmonton experienced a general decline in their share of the Canadian total of this type. However, it is of interest to note that Edmonton did have a small increase during the first ten years; this trend corresponds to the trends of the operations group for that city. Of the increasing proportion not in Calgary and Edmonton, approximately one-fourth of these were located in Toronto for each of the five data years (Table 1, Appendix A).

Possibly the most outstanding feature of the specific types of the operations group is the remarkable rise in Calgary's share of head offices for Oilwell Drilling Contractors, Geophysical and Exploration Drilling Contractors, and Pipeline Companies and Power Distributors. Between the beginning and end of the study period Calgary's share of these three types rose 27, 17 and 22 percentage points respectively (Figure 9b, d, and Figure 10b). Noteworthy is the rapid drop in Edmonton's share of the three aforementioned types. Edmonton also dropped in its share of Oilwell Servicing head offices (Figure 10a); however, cognizance must be



# HEAD OIL OPERATIONS OFFICES IN CALGARY, EDMONTON, AND THE REST OF CANADA, 1950-1970

(By Percentage of Total in Canada)



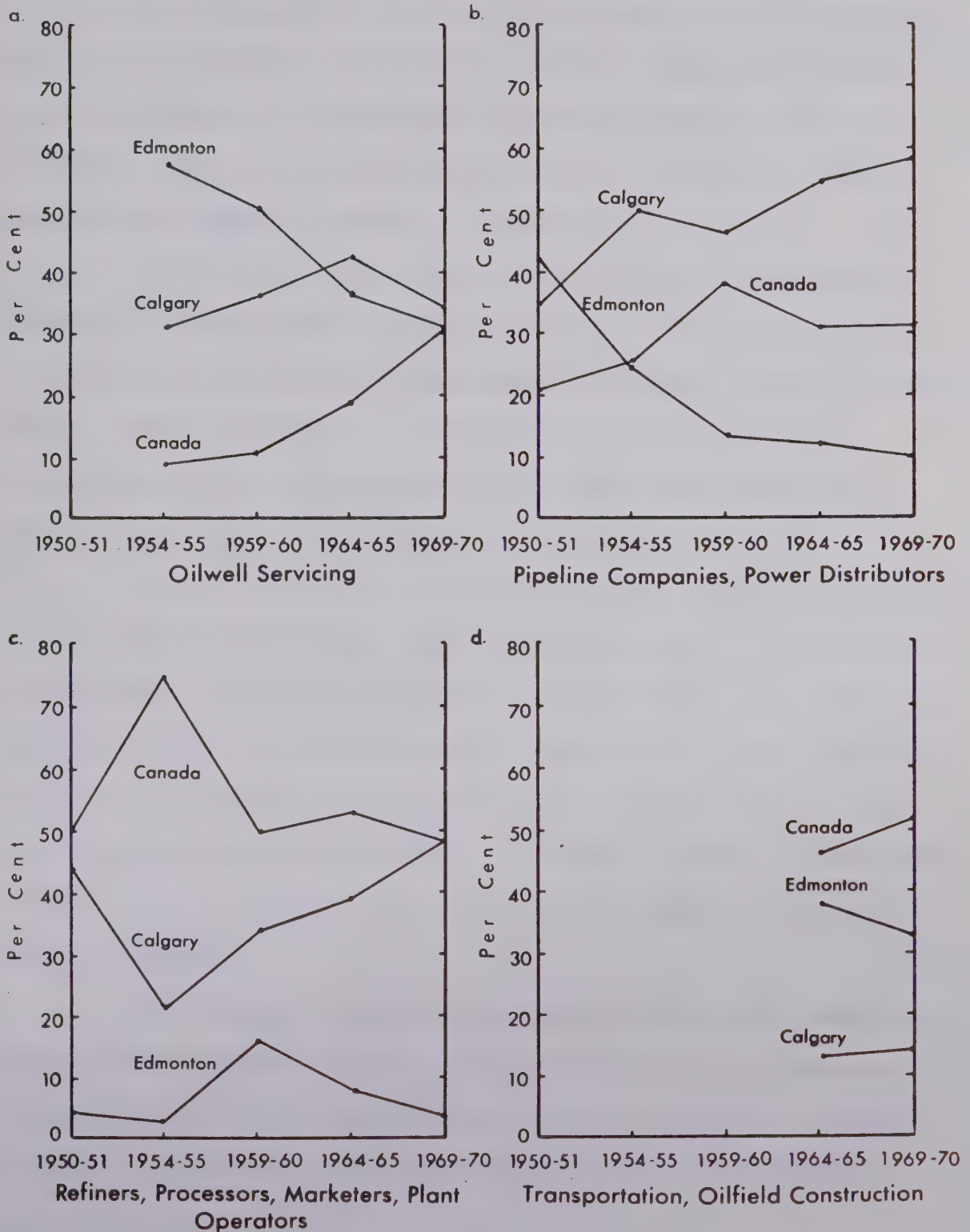
Source: Nickle's Canadian Oil Register

Figure 9



# HEAD OIL OPERATIONS OFFICES IN CALGARY, EDMONTON, AND THE REST OF CANADA, 1950-1970

(By Percentage of Total in Canada)



Source: *Nickle's Canadian Oil Register*

Figure 10



taken of the fact that in 1954-55 and 1959-60 Edmonton had both the largest percentage and number of this type and that in 1969-70 it still was close to the top.

Of the head offices of Geophysical and Exploration Drilling Contractors as well as Oilwell Servicing firms not found in Calgary or Edmonton during the twenty years, the majority (from 50 to 90 per cent) were located in other centres in Alberta (Table 1, Appendix A).

Concerning head offices of Engineers, Designers, Constructors and Fabricators (for which data was available only since 1959-60) they increased in number in both cities since 1959-60 (Table 2). However, as Figure 9c shows, each city's share of the Canadian total fell from 1959-60 to 1964-65 and rose from 1964-65 to 1969-70.

Head offices of Transportation and Oilfield Construction Companies were most highly concentrated in Edmonton and in the rest of Canada especially Alberta both in 1964-65 and 1969-70 (Figure 10d and Table 1, Appendix A). For the two dates for which data were available, Alberta had over one-half of the total in the rest of Canada. Table 2 shows the actual number of this type for Calgary, Edmonton and the rest of Canada.

In summary, Calgary and Edmonton are very important head office centres for oil and gas operations companies. Throughout the study period both cities increased substantially in number of head operations offices but dropped



somewhat in their share of the Canadian total particularly during the last ten years. Calgary stands at the forefront as a head office centre for Oilwell Drilling Contractors, Geophysical and Exploration Drilling Contractors as well as for Pipeline Companies and Power Distributors. Edmonton is more important as a head office centre for Transportation and Oilfield Construction, Oilwell Servicing, and Service and Supply companies for all of which in 1969-70, it had more than one-fourth of the Canadian total.



## CHAPTER IV

### OIL OFFICE INTERVIEW SURVEY

The interview survey was a major source of information for this study. The purpose of this chapter is to present the interview survey design and an outline of the general characteristics of the sample firms. Also, it will briefly present some aspects of the inter- and intra-urban decision making processes concerning oil offices as revealed by the interviews.

#### INTERVIEW SURVEY DESIGN

The total number of oil offices interviewed in Calgary and Edmonton was 112. In Calgary 34 administrative and 22 operations oil offices were contacted whereas the corresponding figures for Edmonton are 19 and 37 respectively.

Interviewees were questioned not only about the location of their own office and office type, but also about all oil offices in general and the development of Calgary and Edmonton as oil centres. Some of the firms interviewed performed functions which overlapped several of the twelve types of oil offices studied, and the interviews from these firms provided valuable information related to several oil office types. Moreover, some of the interviewees were executives



in some capacity, of a number of affiliated companies in addition to the parent company which was sampled. Therefore these officials were able to provide information representative of more than one firm.

In addition to the 112 oil office interviewees, other persons and organizations highly knowledgeable about the oil industry and the development of the two cities as oil centres also were contacted in person. They included: the Canadian Petroleum Association; the Independent Petroleum Association; Mr. S. Raborn, President of Canadian Delhi Oil Limited and member of the board of directors of the Calgary Inn; Mr. E. H. LaBorde, President of LaBorde Petroleums Limited, Calgary; and Dr. E. Roper, former mayor of Edmonton. Telephone contacts were made with persons in the oil industry for additional information. Thus a knowledge was obtained of the location factors pertaining to oil offices which was representative of more than just the 112 oil offices interviewed.

### The Selection of Oil Offices

In selecting oil offices to be interviewed emphasis was given mainly to those major firms, especially the Producers, Explorers and Developers type, which located in Calgary and Edmonton during or prior to the 1950s. It was assumed that these offices established the basic location patterns and would have had a marked bearing upon firms establishing in Calgary and Edmonton in the years to follow. In order to obtain a cross-section of views, however,



interviews from most of the twelve types of offices were also obtained. The general characteristics of the sample firms are discussed later in this chapter.

The sampling method used may be classified as purposive or judgement sampling<sup>1</sup> based mainly on intuition. The knowledge gained about oil offices during the preliminary investigation of the research topic and prior to the interviewing was certainly a most important factor which influenced the choice of this method.

#### The Selection of Interviewees

Once the oil offices to be interviewed were chosen, detailed information about each company from the oil registers was recorded on file cards. This information included the names of officers and directors or owners of the company as well as persons who have been with the company for a long time. Thus, in setting up the interviews, it was possible to ask for these key persons who would be very knowledgeable about their own company's development as well as those who most likely would have been involved with location decision making. As a result, 78 per cent of the persons interviewed were executives.<sup>2</sup> Moreover, a number of persons interviewed

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<sup>1</sup>See D. Harvey, Explanation in Geography. London, Edward Arnold, 1969, pp. 359-361.

<sup>2</sup>Included as executive persons were officers, directors, owners, managers, and superintendents.



started their careers with the oil industry during Turner Valley days and were able to provide valuable insights relating to oil office location decisions during the years prior to and immediately following 1947 when the basic inter- and intra-city location patterns were being established. Table 3 presents the number and percentage of executive and non-executive persons interviewed.

TABLE 3 - EXECUTIVE AND NON-EXECUTIVE PERSONS  
INTERVIEWED IN CALGARY AND EDMONTON

	Administrative		Operations		Administrative & Operations	
	No.	%	No.	%	No.	%
Executive	39	74	48	81	87	78
Non-Executive	14	26	11	19	25	22

Source: Personal interviews, 1970.

#### Rationale for Using Personal Interviews

The personal interview was used in preference to the mail questionnaire for a number of reasons. Mail questionnaires addressed to business firms frequently are not answered by the executives who make location decisions. With this method of gathering data there is the problem of non-response and low response rate. Also, mail questionnaires generally must be limited to questions which the respondents can answer by making check marks or in a few words so responses to questions may be highly generalized. On the other hand, the personal interview offers the possibility of speaking with an



executive or owner and the likelihood of obtaining a high rate of acceptance is very good. Moreover, it allows for greater flexibility and scope because questions and answers can be enlarged upon and respondents can be prompted to tell of their own experiences. Any misinterpretation can be clarified immediately. In the personal interview there is less possibility of bias resulting from a predetermined checklist which presupposed that the factors listed are the applicable ones. Finally, a questionnaire can be used in conjunction with the personal interview to summarize responses.

#### The Interview

Prior to the personal interviewing, a five-part questionnaire was prepared (Appendix B) to summarize the information obtained concerning the factors considered by a firm in making location decisions and concerning the decision making process. The first part included the name and address of the company as well as the area of office space and number of employees in the office establishment. The latter information was used to give some indication of office size. The remaining four parts were: Inter-city Location, Intra-city Location, Changes in Inter-City Location, and Changes in Intra-city Location.

The interview was arranged by phone. Respondents were very cooperative and devoted freely of their time. Interview length varied from one-half to three hours with



the average being about one hour. To start the interview, the writer outlined the nature of the research topic and the type of information being sought. Respondents were then encouraged to express themselves freely regarding their own experiences and thoughts about the development of Calgary and Edmonton as oil centres and the location of their firm. Notes were made on the questionnaire during this informal discussion. The questionnaire was then used to obtain the specific information required. Frequently, additional discussion followed this procedure as almost all interviewees seemed keenly interested in the topic.

#### GENERAL CHARACTERISTICS OF THE SAMPLE FIRMS

##### Administrative Oil Offices

Table 4 outlines the total number, employees, and office space of each of the administrative office types interviewed. The 34 offices in Calgary had a total of 5,350 employees and 1,252,760 square feet of office space while the corresponding figures for the 19 Edmonton offices are 1,920 and 389,290. Therefore, the 53 interviewed administrative offices represented a total of 7,270 employees and 1,642,050 square feet of office space. Amount of office space occupied by individual offices ranged from 900 to 170,000 square feet for Calgary and from 200 to 266,000 square feet for Edmonton. Noteworthy is the fact that the one office in Edmonton had nearly 70 per cent of the floor



TABLE 4 - ADMINISTRATIVE OIL OFFICES INTERVIEWED: TOTAL NUMBER,  
EMPLOYEES, AND OFFICE SPACE

Oil Office Type	CALGARY			EDMONTON		
	Number of Firms	Number of Employees	Office Space (Sq.Ft.)	Number of Firms	Number of Employees	Office Space (Sq.Ft.)
Producers, Explorers, Developers	26	5,298	1,237,200	16	1,896	386,430
Consultants	1	5	900	1	11	1,500
Financial, Investment <sup>1</sup>	4	34	8,160	0	-	-
Lease Brokers, Land Agents	3	13	6,500	2	13	1,360
Total	34	5,350	1,252,760	19	1,920	389,290

<sup>1</sup>Oil and Gas Departments of banks.

Source: Personal interviews, 1970.



space of the offices interviewed in that city.

The size of the interviewed offices in terms of number of employees is shown in Table 5. Of the interviewed

TABLE 5 - ADMINISTRATIVE OIL OFFICES: SIZE OF INTERVIEWED OFFICES ACCORDING TO NUMBER OF EMPLOYEES

Oil Office Type	Number of Offices							
	Calgary				Edmonton			
	Number of Employees 1- 19	20- 99	100- 299	300- 999	Number of Employees 1- 19	20- 99	100- 299	300- 999
Producers, Explorers, Developers	5	6	8	7	9	5	1	1 <sup>2</sup>
Consultants	1	-	-	-	1	-	-	-
Financial, Investment <sup>1</sup>	4	-	-	-	0	-	-	-
Lease Brokers, Land Agents	3	-	-	-	2	-	-	-
Total	13	6	8	7	12	5	1	1
Per Cent for Each City	38	18	24	20	63	27	5	5

<sup>1</sup>Oil and Gas Department of banks.

<sup>2</sup>Over 1000 employees.

Source: Personal interviews, 1970.

offices in Calgary, 44 per cent had more than and 56 per cent less than 100 employees, whereas in Edmonton 10 per cent had more than and 90 per cent less than 100 employees. The one office in Edmonton with over 1000 employees is the only one of the Producers, Explorers and Developers type left in the



city with greater than 100 employees because the only other office (which was interviewed) moved to Calgary this year. Even the one large firm is planning on moving some of its employees to Calgary.<sup>3</sup>

Table 6 shows the time periods during which the interviewed offices located in Calgary and Edmonton. Thirty-five

TABLE 6 - ADMINISTRATIVE OIL OFFICES: TIME PERIOD OF INITIAL LOCATION IN CALGARY AND EDMONTON

Time Period	Number of Oil Offices											
	Calgary						Edmonton					
	*A	C	F	H	All No.	Types %	A	C	F	H	All No.	Types %
Prior to 1920	1				1	3						
1920-- 1929	4				4	12						
1930 - 1939	0				0							
1940 - 1944	5				5	15						
1945 - 1949	6		1		7	20	6			1	7	37
1950 - 1954	7		2	1	10	29	4	1			5	26
1955 - 1959	1	1	1	1	4	12	4			1	5	26
1960 - 1964	2				2	6	2				2	11
1965 - 1970	0			1	1	3						
Total	26	1	4	3	34	100	16	1	0	2	19	100
Prior to 1947	12	0	0	0	12	35	1	0	0	0	1	5
1947 and after	14	1	4	3	22	65	15	1	0	2	18	95

\*  
A - Producers, Explorers, Developers  
C - Consultants  
F - Financial, Investment (Oil and Gas Departments of Banks)  
H - Lease Brokers, Land Agents

Source: Personal interviews, 1970.

<sup>3</sup> Pers. comm. V. Allen, Imperial Oil Limited, Edmonton, April, 1971.



per cent of the Calgary interviewed offices located in the city prior to the 1947 Leduc discovery and these were all Producers, Explorers and Developers. The one company established in Edmonton prior to 1947, also was a Producer, Explorer and Developer and located in the city in 1946 because of its exploration activity in the Edmonton region; in fact this firm was Imperial Oil which drilled the Leduc discovery well.

### Oil Operations Offices

The number of oil operations offices interviewed and total employees for each type are shown in Table 7. The

TABLE 7 - OIL OPERATIONS OFFICES INTERVIEWED: NUMBER OF EACH TYPE AND TOTAL EMPLOYEES

Oil Office Type	Calgary		Edmonton	
	Number	Total Employees	Number	Total Employees
Service and Supply	11	182	21	841
Oilwell Servicing	1	18	2	23
Transportation and Oilfield Construction	1	3	3	61
Engineers, Designers, Constructors	1	190	3	245
Geophysical and Exploration Drilling Contractors	2	130	0	-
Oilwell Drilling Contractors	2	22	5	127
Pipeline Companies and Power Distributors	4	275	2	217
Total	22	820	36	1,514

Source: Personal interviews, 1970.



22 operations in Calgary had a total of 820 employees or an average of 37 per office whereas the 36 in Edmonton had 1,514 or an average of 42 per office. The averages are indicative of the tendency for Edmonton operations firms, especially Service and Supply, to be larger than those in Calgary.

Size, in terms of number of employees, of the interviewed offices is shown in Table 8. The majority of the offices in both cities had less than 50 employees. To be noted is that all except one, or 91 per cent, of the Service and Supply offices in Calgary had fewer than 20 employees whereas in Edmonton there were 12 out of 21 of this size or 57 per cent.

The time periods during which the oil operations offices located in Calgary and Edmonton is shown in Table 9. Nine per cent located in Calgary prior to the 1947 Leduc discovery whereas only three per cent located in Edmonton prior to the same date. Mention has been made of the fact that Calgary had operations offices before 1947 because of the Turner Valley activity. Indeed, two of the Service and Supply firms interviewed located in Calgary during the 1930s because of Turner Valley and the exploration activity in Southern Alberta.

#### INTER- AND INTRA-URBAN LOCATION DECISION MAKING

In this section of the chapter the decision making process concerning oil office location, as revealed by the personal interviews, will be discussed. A process in the



TABLE 8 - OIL OPERATIONS OFFICES: SIZE OF INTERVIEWED  
OFFICES ACCORDING TO NUMBER OF EMPLOYEES

	Number of Offices									
	Calgary					Edmonton				
	Number of Employees					Number of Employees				
	1-19	20-49	50-99	100-299		1-19	20-49	50-99	100-299	
Service and Supply	10	1	-	-		12	5	1	3	
Oilwell Servicing	2	-	-	-		1	1	-	-	
Transportation and Oilfield Construction	1	-	-	-		1	2	-	-	
Engineers, Designers, Constructors, Fabricators	-	-	-	1		1	2	-	1	
Geophysical and Exploration Drilling Contractors	-	1	-	1		-	-	-	-	
Oilwell Drilling Contractors	2	-	-	-		2	3	-	-	
Pipeline Companies and Power Distributors	-	-	2	1		1	1	-	1	
Total	15	2	2	3		18	13	1	5	
Per Cent for Each City	68	9	9	14		49	35	3	13	

Source: Personal interviews, 1970.



TABLE 9 - OIL OPERATIONS OFFICES: TIME PERIODS OF INITIAL LOCATION IN CALGARY AND EDMONTON

Time Period	Number of Oil Offices																	
	Calgary									Edmonton								
	B	I	L	E	G	D	J	All Types No.	%	B	I	L	E	G	D	J	All Types No.	%
Prior to 1920	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1920 - 1929	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1930 - 1939	2	-	-	-	-	-	-	2	9	-	-	-	1	-	-	-	1	3
1940 - 1944	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1945 - 1949	2	-	-	-	1	-	-	3	13	9	-	1	-	-	2	1	13	35
1950 - 1954	1	-	-	1	1	1	3	7	32	2	1	-	1	-	3	1	8	22
1955 - 1959	4	1	-	-	-	-	1	6	27	3	1	2	-	-	-	-	6	16
1960 - 1964	2	-	-	-	-	-	-	2	9	5	-	-	1	-	-	-	6	16
1965 - 1970	-	-	1	-	-	1	-	2	9	2	-	-	1	-	-	-	3	8
Total	11	1	1	1	2	2	4	22	100	21	2	3	4	-	5	2	37	100
Prior to 1947	2	0	0	0	0	0	0	2	9	0	0	0	1	-	0	0	1	3
1947 and after	9	1	1	1	2	2	4	20	91	21	2	3	3	-	5	2	36	97

\* B - Service and Supply  
I - Oilwell Servicing  
L - Transportation and Oilfield Construction  
E - Engineers, Designers, Constructors, Fabricators  
G - Geophysical and Exploration Drilling Contractors  
D - Oilwell Drilling Contractors  
J - Pipeline Companies and Power Distributors

Source: Personal interviews, 1970.



context of this discussion may be defined as a course of activity or proceeding. Some facts will be presented about the persons and methods involved in formulating decisions to locate offices at the inter- and intra-urban levels and about the course of activity followed in effecting the decisions.

### Inter-Urban Location Decision Making

Of the 112 persons interviewed in Calgary and Edmonton, 51 were executives who were directly involved with the decisions to initially locate the offices in the respective city. These persons therefore, were able to give precise information of how location decisions were made. The majority of the 51 persons represented small offices. The remaining 61 interviewees, representing primarily medium-to large-sized offices, had good knowledge of the individuals or persons who made the decisions.

It was found that for major companies as well as small ones, a large number of the decisions were made by individuals rather than by committees. For small offices frequently only one person started the firm and therefore made the decision. However, with respect to the large offices, the president of one oil company (Producer, Explorer and Developer type) pointed out that about fifteen or twenty years ago when many of the oil companies located in Calgary or Edmonton, individual executives such as presidents played a much stronger role in location decisions than today and



frequently made the decisions according to their own desires and whims. On the other hand most of the decision making today, particularly for large firms, is done by committees.

There were three ways by which the firms of the 112 interviewed offices arrived at decisions to initially locate in either Calgary or Edmonton: 1) a formal study; 2) an informal study; and 3) none at all. A formal study culminated in a major report while an informal one usually meant a cursory survey which may or may not have resulted in a written report. A breakdown of the ways in which the 112 firms arrived at the inter-city location decisions is shown in Table 10. The striking feature is that nearly all the

TABLE 10 - INTER-CITY OFFICE LOCATION:  
FREQUENCY OF LOCATION STUDIES

Oil Office Group	Calgary			Edmonton		
	Formal Study	Informal Study	None	Formal Study	Informal Study	None
Administra- tive	0	2	32	-	-	19
Operations	1	1	20	2	1	34
Total	2	3	52	2	1	52

firms engaged in no study in deciding to locate in Calgary or Edmonton. However, the results should be viewed with some caution because some of the 61 interviewees who were not directly involved with the location decision, expressed only



a view of the means used based on the best knowledge available.

One reason for the lack of location studies, at the inter-city level is that fact that 53 of the interviewees started their business within either Calgary or Edmonton or their regions. Therefore, the decision to locate in either city did not necessitate a study because the individuals knew well from personal knowledge about the opportunities which were available for the business in the city in which they located. Of the other firms which did not engage in a location study, 32 came from the United States, 2 from Europe and 18 from Canada outside of Alberta. In regard to a number of the American firms of the Producers, Explorers, and Developers type, geologists working in Southern Alberta prior to 1947 made a recommendation to the parent company to locate in Calgary, and usually the president or the president together with other officers made the final decision. In one case the chief geologist in New York authorized the establishment of an office in Calgary. With other American and Canadian firms a knowledge of the oil activity in Calgary or Edmonton followed by a visit to either city prompted company officials to make a decision to establish an office. The decision of Imperial Oil and of several other large Producers, Explorers and Developers type oil firms to locate in Calgary prior to 1947 had a marked influence upon the decisions of other oil companies to also locate in that city.



A very important decision by Imperial Oil to transfer its exploration activity from Southern Saskatchewan to the Edmonton region in 1945 and 1946 was probably a critical factor in the development of Calgary and Edmonton as oil office centres and thus in the many inter-city location decisions which were made following the Leduc discovery in 1947. The transfer of Imperial Oil's operation to Alberta was due to changes in certain of the oil regulations in Saskatchewan having to do mainly with an expropriation clause introduced by Saskatchewan's first socialist government (the Cooperative Commonwealth Federation elected in 1944) which discouraged exploration.

There were only eight firms which did either a formal or informal location study in deciding upon the initial location in Calgary or Edmonton. Management of one operations firm investigated a number of locations in Alberta and on the basis of a comprehensive study decided in favor of Edmonton. On the basis of an informal study, the officers of a Tulsa based operations decided to move the Canadian Head office from Edmonton to Calgary.

Three of the firms interviewed conducted formal location studies to assess the possibilities of relocating offices at the inter-city level. For one of these firms (a major Producer, Explorer and Developer) the Calgary office carried out two preliminary and two in-depth studies and recommended the centralization of all offices including



the Edmonton one in Calgary. The corporate head office rejected the recommendation and this decision had a definite influence upon the location of other oil offices.

An interesting aspect about the decision making process revealed by the interviews is that with increasing emphasis by large firms upon committee rather than individual decision making, greater recognition is being given to the impact of a relocation upon employees including professional persons. This change is having an effect upon office location in that there is greater reluctance to move offices from one city to the other. The problem of moving employees from Edmonton to Calgary influenced the officers of one firm to centralize a major oil office in Edmonton.

#### Intra-Urban Location Decision Making

Decisions to locate offices at the intra-urban level resulted in considerably more formal and informal location studies than decisions involved with inter-urban office location (Table 11). The table reflects only the studies related to decisions affecting the present location of the offices. All of the 14 Calgary administrative offices and all but one of the 6 Edmonton ones which undertook formal or informal studies in deciding to establish at their present location within the city were medium or large-sized Producers, Explorers, and Developers. The one exception in Edmonton was a Lease Broker and Land Agent firm. Of the operations firms which undertook location studies, the total



TABLE 11 - INTRA-CITY OFFICE LOCATION:  
FREQUENCY OF LOCATION STUDIES

Oil Office Group	Calgary			Edmonton		
	Formal Study	Informal Study	None	Formal Study	Informal Study	None
Administra- tive	9	5	20	3	3	19
Operations	7	1	14	4	8	34
Total	16	6	34	7	11	53

eight in Calgary and seven of the twelve in Edmonton were medium or large-sized offices in terms of employees for their specific office type. Thus for both office groups it was predominantly the medium or large offices which conducted studies.

The intra-urban location decisions were made either by a committee or by individuals. A committee was involved in the location decisions of 38 out of the 40 firms which undertook location studies. The use of the committee system is partly related to the size of the firm and to the fact that more decisions are made by that method today. As already mentioned, the firms which conducted studies were mostly the medium and large ones and for them the need to carefully weigh various location factors are much greater than for the small ones because of the number of employees involved, the need to carefully plan for the use of the space, and the large financial commitments to a long term lease or to the construction of a building. As an example,



one Producer, Explorer and Developer type of firm with 41 employees currently, committed itself to three floors of office building space on a ten-year lease costing over \$2 million. Of the 72 offices which did not carry out a location study, a committee made the location decision for 15 of them. Therefore, in the cases of 57 out of the total 112 interviewed offices, the location decision was made by one individual and, as already indicated these were predominantly small firms. For these 57 firms the decision made by the individual in nearly all cases was based on personal experience and a knowledge of the city.

The method of decision making, whether by a committee which relied mainly on a study, or by the individual who relied primarily on personal experience, did have an influence upon the location of offices. The committee method tended to result in a rather precise selection of a site, usually a choice amongst two or three alternatives, whereas the individual method tended to result in a much more random non-specific selection. However, it is recognized that the freedom to choose a site is more restricted for a large office than a small one. One other basic difference between the committee and individual method was that the individual location decisions much more strongly reflected the biases, ideals and experiences of the individuals.

In 89 of the 112 cases, the decision to locate the office within the city was made by an individual or committee



in either Calgary or Edmonton. This high proportion of locally based decision making is due to the fact that the local office in most instances was the firm's head decision making office. For nineteen of the interviewed offices, mainly large ones, a recommendation to locate was made by a committee, and in a few cases by individuals, to a national or international head office for approval. Of four branch offices in Edmonton, two received approval to locate from the Canadian head office in Calgary while two of them made recommendations to the Calgary head office which in turn received approval from a national or international head office.

#### Decision Making, Summary

Most of the 112 interviewees were able to provide either precise or quite accurate information about decisions concerning the location of their offices at both the inter- and intra-urban levels. Nearly one-half of the interviewees were directly involved with the decision making.

Location decisions at the inter-urban level were made largely by individuals for both small and large firms. With small firms usually one person started the business and made the decision whereas with large firms there was a tendency at the time the offices were established<sup>4</sup> for

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<sup>4</sup>About two-thirds of the interviewed offices located in either Calgary or Edmonton prior to 1955 (Tables 6 and 9).



individual executives to make the location decisions rather than committees as is the case today. In almost all of the 112 cases no study was associated with the decision making process.

At the intra-urban level, decisions to establish the interviewed offices at their present sites involved more studies than at the inter-city level and the trend, particularly for large offices, was for location decisions to be made by a committee. The decisions made by individuals were based primarily on the person's knowledge of the situation.

The examination of inter- and intra-city location decision making was brief. However, some evidence was presented which indicates that the decision making process is of importance in influencing the location of oil offices and therefore should be taken into consideration as a location factor. However, the whole topic is one that needs much more investigation. The results outlined are tentative but may provide the reader with a better perspective from which to examine the results of the interview survey as presented in the following chapters.



## CHAPTER V

### INTER-CITY OIL OFFICE DEVELOPMENT, 1950 - 1970, AND LOCATION FACTORS

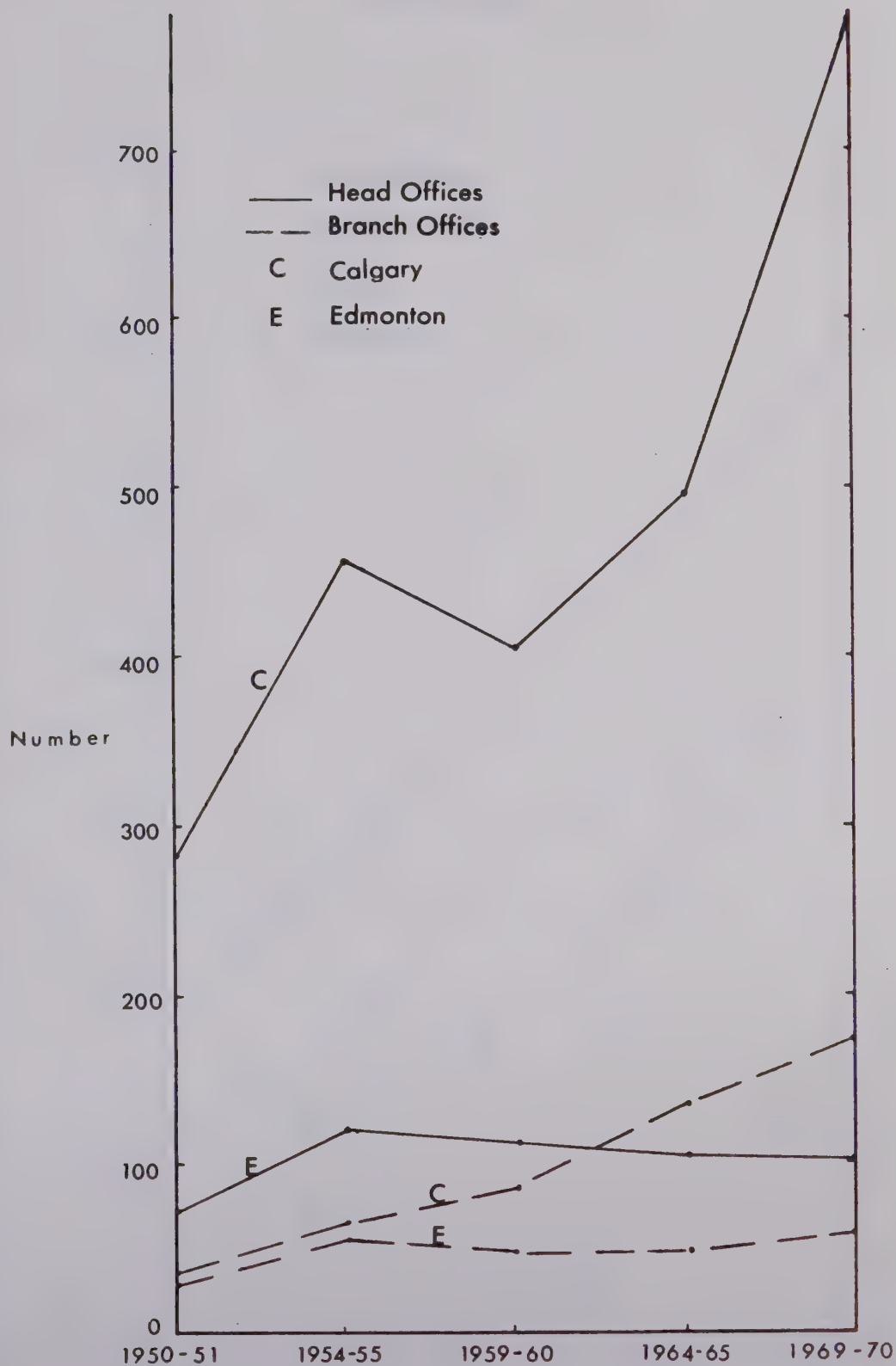
This chapter will focus upon the inter-city development of oil offices from 1950 to 1970 and discuss the location factors which influenced that development as revealed by the interview survey. The chapter is organized in the following manner. The development of oil offices in Calgary and Edmonton from 1950 to 1970 will be outlined first. Next the location factors for administrative and operations oil offices will be analyzed and the inter-city location trends will be discussed. An examination will be made of the factors relevant to the development of Calgary as the oil administrative centre rather than Edmonton and finally, a brief presentation will be made of the linkages which exist between the two cities.

#### HEAD AND BRANCH OIL OFFICES IN CALGARY AND EDMONTON, 1950-1970

Part of Chapter III outlined the marked development and concentration of head oil offices in Calgary and Edmonton during the past twenty years. However, the two cities also contain a large number of branch oil offices. Figures 11 and 12 show the numerical development of head and branch oil offices in the two cities during the study period. A



## HEAD AND BRANCH ADMINISTRATIVE OIL OFFICES, 1950-1970

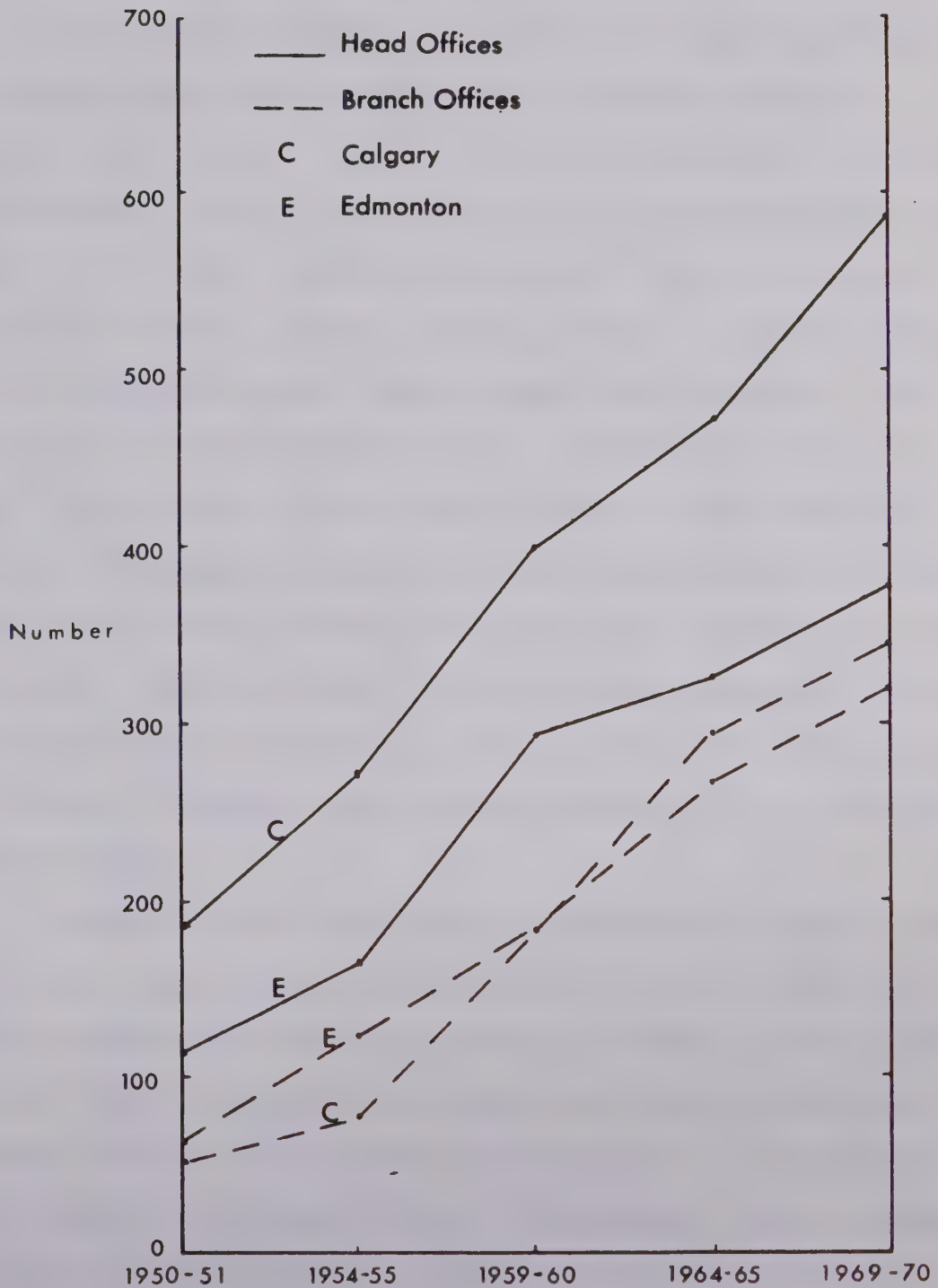


Source: Nickle's Canadian Oil Register

Figure 11



# HEAD AND BRANCH OIL OPERATIONS OFFICES, 1950-1970



Source: Nickle's Canadian Oil Register

Figure 12



tabulation of the number of head and branch offices for both oil office groups and the types within each group as shown in Table 12.

Throughout the twenty-year study period Calgary had more head and branch administrative oil offices than Edmonton and both head and branch offices showed a general increase (Figure 11). On the other hand, head and branch administrative offices for Edmonton increased gradually from 1950-51 to 1954-55, during the years of the initial major discoveries in its region, and then showed a general slow decline thereafter. The large number and remarkable rate of increase of head administrative oil offices in Calgary leaves little doubt of its role as the oil administrative centre. The numerical decline in head administrative offices between 1954-55 and 1959-60 is largely as a result of a sharp drop in the number of head offices of the Producers, Explorers and Developers type during those five years from 396 to 280 offices. Comments about this decline will be made later in this chapter.

Growth of head and branch operations offices in both cities was rapid and continuous (Figure 12 and Table 12). Calgary dominated Edmonton in terms of number of head operations offices throughout the twenty-year study period and in branch offices during the last ten years. The larger number of branch operations offices in Edmonton than in Calgary from 1950-51 to 1959-60 is related to the intense exploration and production activity in its region during that time.



TABLE 12-OIL ADMINISTRATIVE AND OPERATIONS HEAD AND BRANCH OFFICES IN  
CALGARY AND EDMONTON, 1950 - 1970

Oil Office Group and Type	1950-51				1954-55				1959-60				1964-65				1969-70													
	Calg.	Edm.	Calg.	Edm.	Calg.	Edm.	Calg.	Edm.	Calg.	Edm.	Calg.	Edm.	Calg.	Edm.	Calg.	Edm.														
	H.O. <sup>1</sup>	B.O. <sup>2</sup>	T <sup>3</sup>	H.O.	B.O.	T	H.O.	B.O.	T	H.O.	B.O.	T	H.O.	B.O.	T	H.O.	B.O.	T												
Administrative																														
Producers, Explorers, Developers	230	18	248	47	8	55	396	36	432	103	34	137	280	53	333	73	22	95	290	82	372	53	18	71	412	112	524	47	20	67
Consultants - Data Processors	25	0	25	13	2	15	38	3	41	8	2	10	88	9	97	24	5	29	146	23	169	39	7	46	286	33	319	47	12	59
Financial and Investment	18	19	37	1	19	20	12	24	36	4	18	22	17	23	40	6	21	27	21	26	47	3	24	27	21	24	45	2	25	27
Lease Brokers and Land Agents	9	0	9	10	0	10	13	0	13	5	2	7	19	1	20	10	0	10	37	2	39	8	0	8	55	2	57	5	0	5
Total Administrative	282	37	319	71	29	100	459	63	522	120	56	176	404	86	490	113	48	161	494	133	627	103	49	152	774	171	945	101	57	158
Operations																														
Service and Supply	92	45	137	61	49	110	122	65	187	95	95	190	185	143	328	196	140	336	227	216	443	199	205	404	286	251	537	233	236	469
Oilwell Drilling Contractors	20	1	21	17	4	21	33	4	37	24	12	36	41	6	47	15	11	26	31	3	34	9	11	20	36	4	40	10	15	25
Engineers, Designers, Constructors, Fabricators	-	-	-	-	-	-	-	-	-	-	-	-	15	5	20	12	8	20	29	23	52	21	17	38	44	27	71	28	25	53
Geophysical and Exploration	59	2	61	28	4	32	94	4	98	29	4	33	91	10	101	23	9	32	69	6	75	11	4	15	77	12	89	6	2	8
Drilling Contractors	-	-	-	-	-	6	1	7	11	2	13	23	9	32	32	5	37	26	16	42	22	10	32	24	15	39	22	13	35	
Oilwell Servicing	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pipeline Companies and Power Distributors	5	0	5	6	1	7	10	0	10	5	1	6	28	3	31	8	2	10	48	4	52	11	7	18	54	4	58	9	6	15
Refiners, Processors, Marketers, and Plant Operators	10	4	14	1	6	7	7	3	10	1	7	8	17	6	23	8	9	17	23	10	33	5	8	13	37	13	50	3	15	18
Transportation and Oilfield Construction	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	17	35	49	7	56	30	19	49	68	8	76
Total Operations	186	52	238	113	64	177	272	77	349	165	121	286	400	182	582	294	184	478	471	295	766	327	269	596	588	345	933	379	320	699
Total Administrative and Operations	468	89	557	184	93	277	731	140	871	285	177	462	804	268	1072	407	232	639	965	428	1393	430	318	748	1362	516	1878	489	377	857

<sup>1</sup> H.O.--Head Office; <sup>2</sup> B.O.--Branch Office; <sup>3</sup> T - Total

Source: Nickle's Canadian Oil Register

<sup>1</sup>H.O.--Head Office; <sup>2</sup>B.O.--Branch Office; <sup>3</sup>T - Total  
Source: Nickle's Canadian Oil Register



The major oil discoveries resulted in many firms from Calgary as well as from the United States opening branch offices in Edmonton to provide the many services and supplies needed particularly for oilwell drilling. Of the operations firms with head offices in Calgary in 1950-51, 22 per cent had established branch offices in Edmonton and for 1954-55 this figure had risen to 30 per cent.<sup>1</sup>

#### OIL ADMINISTRATIVE AND OPERATIONS OFFICES IN CALGARY AND EDMONTON, 1950-1970

Early in this study it was pointed out that Calgary is considered to be the administrative centre of the oil industry and Edmonton the operations centre. The general impression gained from the literature on Calgary was that the city had comparatively few oil operations offices. However, throughout the entire twenty-year period, more offices of both the administrative and the operations group were located in Calgary than in Edmonton (Table 13). Certainly, Calgary has dominated as an administrative oil office centre. In 1950-51 Calgary had 319 administrative offices and Edmonton 100, whereas in 1969-70 Calgary had 945 and Edmonton 158; this growth was 192 per cent for Calgary only 58 per cent for Edmonton. But very noteworthy is the fact that in 1950-51, 238 oil operations offices were located in Calgary and 177 in Edmonton while in 1969-70 Calgary had 933 and Edmonton 699. These facts clearly reveal that Calgary is

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<sup>1</sup>These figures were computed from data in Tables 12 and 19.



TABLE 13 - NUMBER OF OIL ADMINISTRATIVE AND OPERATIONS  
OFFICES IN CALGARY AND EDMONTON, 1950-70

Oil Office Group and Type	1950 - 51		1954 - 55		1959 - 60		1964 - 65		1969 - 70						
	Calg.	Edm. and Edm.	Calg.	Edm. and Edm.	Calg.	Edm. and Edm.	Calg.	Edm. and Edm.	Calg.	Edm. and Edm.					
<u>Administrative</u>															
Producers, Explorers, Developers	248	55	303	432	137	569	333	95	428	372	71	443	524	67	591
Consultants, Data Processors	25	15	40	41	10	51	97	29	126	169	46	215	319	59	378
Financial and Investment	37	20	57	36	22	58	40	27	67	47	27	74	45	27	72
Lease Brokers and Land Agents	9	10	19	13	7	20	20	10	30	39	8	47	57	5	62
Total Administrative	319	100	419	522	176	698	490	161	651	627	152	779	945	158	1103
<u>Operations</u>															
Service and Supply	137	110	247	187	190	377	328	336	664	443	404	847	537	469	1006
Oilwell Drilling Contractors	21	21	42	37	36	73	47	26	73	34	20	54	40	25	65
Engineers, Designers, Constructors, Fabricators	-	-	-	-	-	-	20	20	40	52	38	90	71	53	124
Geophysical and Exploration Drilling Contractors	61	32	93	98	33	131	101	32	133	75	15	90	89	8	97
Oilwell Servicing	-	-	-	7	13	20	32	37	69	42	32	74	39	35	74
Pipeline Companies and Power Distributors	5	7	12	10	6	16	31	10	41	52	18	70	58	15	73
Refiners, Processors, Marketers, and Plant Operators	14	7	21	10	8	18	23	17	40	33	13	46	50	18	68
Transportation and Oilfield Construction	-	-	-	-	-	-	-	-	-	35	56	91	49	76	125
Total Operations	238	177	415	349	286	635	582	478	1060	766	596	1362	933	699	1632
Total Administrative and Operations	557	277	834	871	462	1333	1072	639	1711	1393	748	2141	1878	857	2735

Source: Nickle's Canadian Oil Register



still a very important centre for oil operations offices, at least numerically. Recognition, however, must be given to the fact that these statistics do not take into account size of office or firm. Nevertheless because of the large number involved, the figures are significant.

### Administrative Oil Offices

From 1950 to 1970, Calgary dominated Edmonton in all four types of administrative oil offices (i.e. Producers, Explorers and Developers; Consultants-geological, geophysical, engineering, surveying-and Data Processors; Financial and Investment; and Lease Brokers and Land Agents) and also showed an increase for each type throughout (Figures 13 and 14 and Table 13). In Edmonton, the specific types of this group either increased very slowly numerically or showed a declining trend.

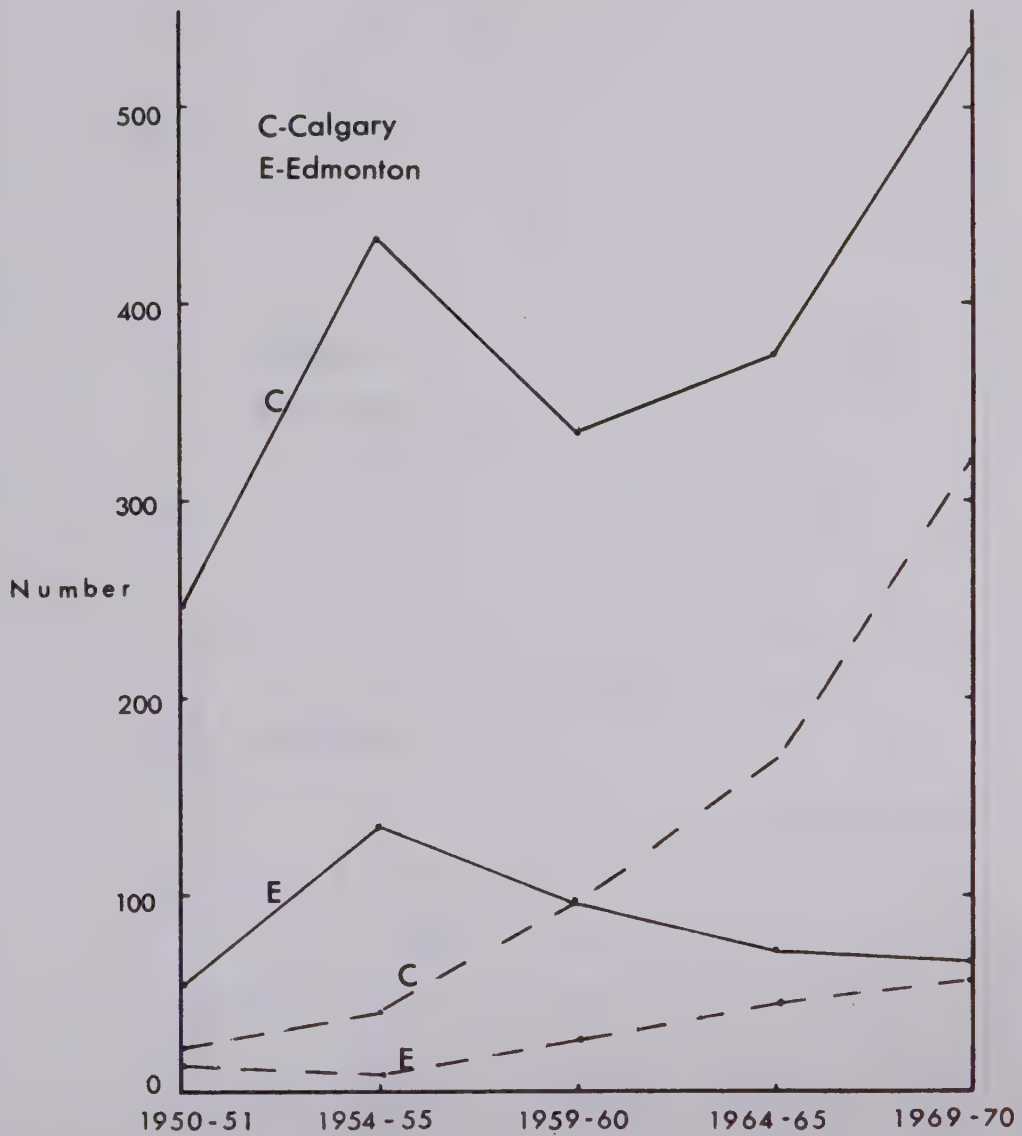
Producers, Explorers and Developers are numerically by far the largest of the administrative group and have been located predominantly in Calgary. The size of the companies which these offices represent vary greatly from the large oil companies such as Imperial Oil, Gulf, Shell, and Texaco, to very small ones owned and managed by two or three persons. Within this type there are the major integrated and major independent<sup>2</sup> companies active in exploration, production, and

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<sup>2</sup>An independent oil company may be described as one that is not a major international oil company and independent of foreign major company control.



# ADMINISTRATIVE OIL OFFICES, CALGARY AND EDMONTON, 1950-1970



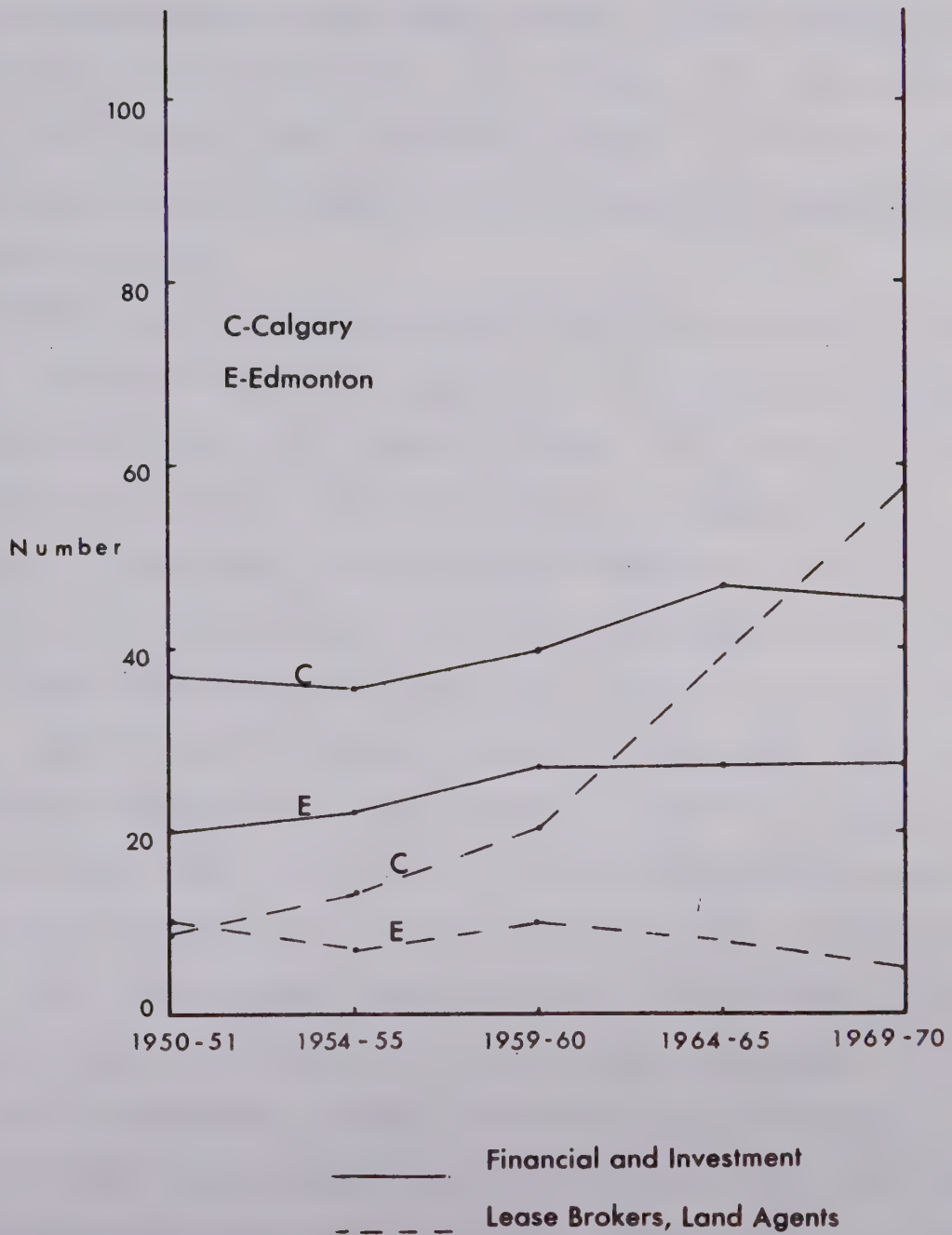
———— Producers, Explorers, Developers  
 - - - - - Consultants, Data Processors

Source: Nickle's Canadian Oil Register

Figure 13



ADMINISTRATIVE OIL OFFICES,  
CALGARY AND EDMONTON,  
1950-1970



Source: *Nickle's Canadian Oil Register*

Figure 14



development, minor independent firms with land holdings only, and sundry royalty companies with an interest in a small number of producing wells or in mineral rights. Some of the firms of this type are split into several subsidiaries which usually are managed by the same persons. Three reasons were mentioned by interviewees for the division of a firm into a number of separate small companies, namely, operational efficiency, some tax advantages, and the desire to keep different functions separate.

The time interval of most active development of Producers, Explorers and Developers for both Calgary and Edmonton was from 1950-51 to 1954-55 (Figure 13), during the initial oil boom years. A total of 363 new companies, the majority of them small, were either formed or located in the two cities in an attempt to make their fortunes in oil (Table 14). Some were successful, but many also went out of business. The period of greatest decline of this type for both Calgary and Edmonton was from 1954-55 to 1959-60 (Figure 13). Table 14 shows that this was the time interval during which the greatest number of firms or offices exited, (a total of 268). The time interval from 1959-60 to 1964-65 was one of slow increase for Producers, Explorers and Developers in Calgary and of continued decline for this type in Edmonton. Sproule<sup>3</sup> calls this period the long five-year dry spell in major discoveries and this situation undoubtedly had a marked

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<sup>3</sup>Dr. J. C. Sproule, "Exploration and Discovery," in J. D. Hilborn, ed. Dusters and Gushers: The Canadian Oil and Gas Industry, Toronto, Pitt, 1968, p. 18.



TABLE 14 - PRODUCERS, EXPLORERS, DEVELOPERS: DEVELOPMENT  
AND EXIT OF FIRMS, 1950-1970

	1950-51	1954-55	1959-60	1964-65	1969-70
New Firms or Offices	-	363	127	187	303
Old Firms or Offices <sup>1</sup>	-	206	301	256	288
Total	303	569	428	443	591
Number which Exited <sup>2</sup>			268	172	155

<sup>1</sup>Old designates that the firms or offices existed during the previous five-year period.

<sup>2</sup>Firms which went out of business or became dormant.

Source: Nickle's Canadian Oil Registers.

bearing upon the development of new oil companies and offices. A second marked increase in the development of this type occurred in Calgary from 1964-65 to 1969-70 during which they grew from 372 to 524. A total of 303 new companies or offices were established during this five-year interval (Table 14) and nearly all of these were located in Calgary. This development is related to new major oil discoveries after 1964 and to the great expansion of oil activity in the North.

Consultants and Data Processors were most highly concentrated in Calgary during the study period. Although Calgary and Edmonton had about the same number in 1950-51, Calgary greatly increased its share of the total particularly after 1954-55. The sharp numerical rise in Calgary after 1964-65, from 169 to 319, is due in part to the establishment of 36 Data Processors in the city<sup>4</sup> and also to the rapid growth of geological, geophysical, engineering and surveying offices.

<sup>4</sup>Nickle's Canadian Oil Register. Calgary, C. O. Nickle Publishing Company.



Financial and Investment offices related to the oil and gas industry experienced slow growth in both cities from 1950 to 1970, and nearly twice as many were located in Calgary as in Edmonton throughout.

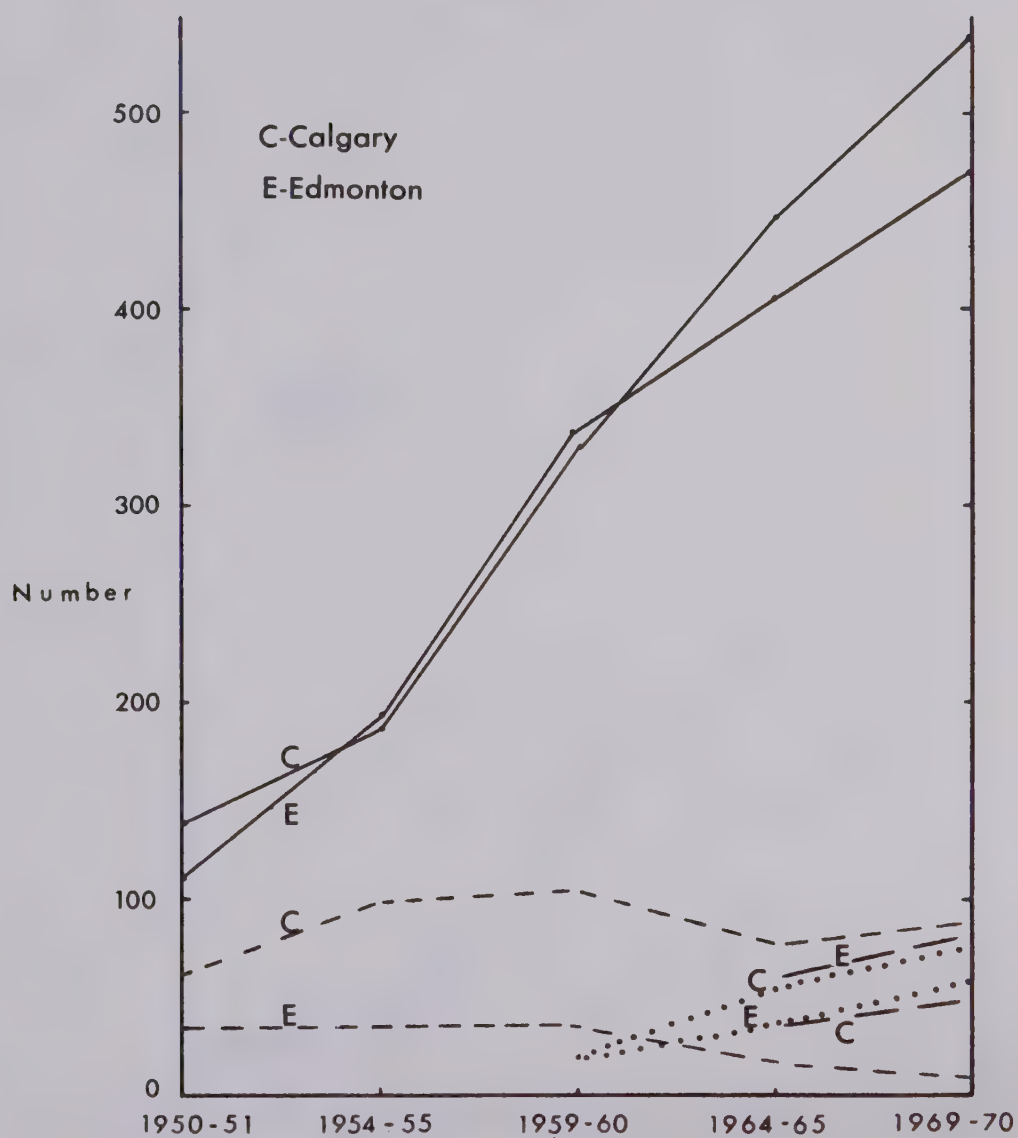
Lease Brokers and Land Agents declined slowly in Edmonton during the twenty years but increased rapidly in Calgary especially after 1959-60. Firms interviewed by the writer stated that this marked development in Calgary is related to a shift of this type of oil office from Edmonton to Calgary and also due to the fact that a large number of landmen who were employed by and gained experience with oil companies (i.e. Producers, Explorers and Developers) during the initial oil boom years started their own firms particularly after 1959.

#### Oil Operations Offices

Edmonton stands out as being much more important as a centre for the location of the various offices of the oil operations group than for offices of the administrative group. In comparison with Calgary, it had more Transportation and Oilfield Construction offices, more Oilwell Servicing offices from 1954-55 to 1959-60, and either slightly more or nearly as many Service and Supply offices throughout the study period (Figures 15 and 16 and Table 13). However, Calgary did have more of the following offices than Edmonton: Geophysical and Exploration Drilling Contractors; Engineers,



# OIL OPERATIONS OFFICES, CALGARY AND EDMONTON, 1950-1970



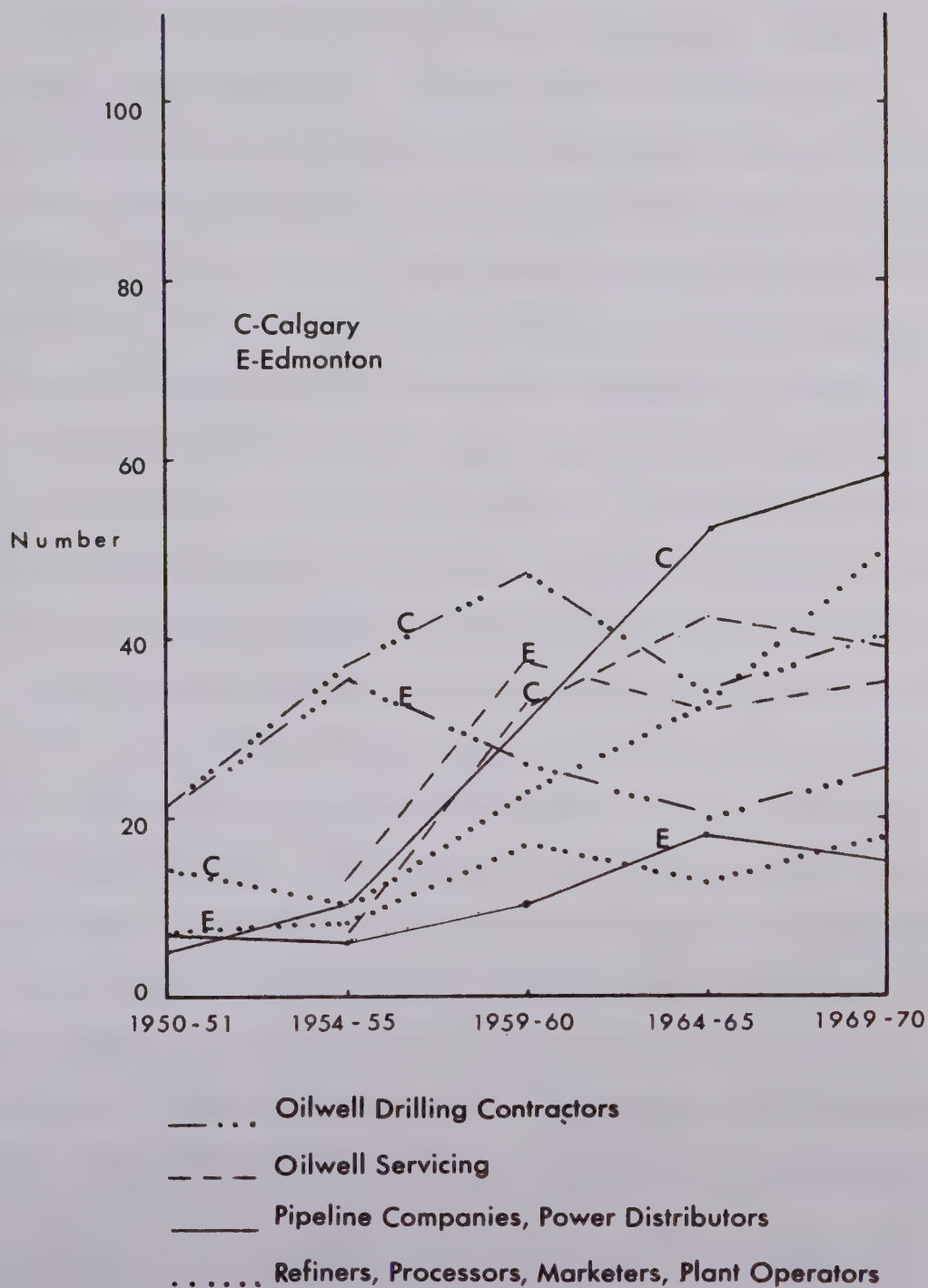
- Service and Supply
- Geophysical and Exploration Drilling Contractors
- ..... Engineers, Designers, Constructors, Fabricators
- Transportation, Oilfield Construction

Source: Nickle's Canadian Oil Register

Figure 15



# OIL OPERATIONS OFFICES, CALGARY AND EDMONTON, 1950-1970



Source: Nickle's Canadian Oil Register

Figure 16



Designers, Constructors and Fabricators; Pipeline Companies and Power Distributors; Oilwell Drilling Contractors; and Refiners, Processors, Marketers and Plant Operators.

The most noteworthy feature of the oil operations types is the rapid growth of Service and Supply offices in both Calgary and Edmonton. Calgary had 137 Service and Supply offices in 1950-51 and 537 in 1969-70, whereas Edmonton for the same dates had 110 and 469 respectively (Table 13). Calgary's increasing lead over Edmonton after 1959-60 is a reflection of the increasing number of branch sales offices being established in Calgary by Edmonton firms because of the desire to have close contact with the Producers, Explorers and Developers there.<sup>5</sup> Whereas in 1959-60 only 59 Edmonton Service and Supply firms had branch offices in Calgary, by 1969-70 this number had increased to 93.<sup>6</sup>

Concerning Transportation and Oilfield Construction offices, for both 1964-65 and 1969-70 (the only two data years for which data were available) more were located in Edmonton than Calgary. The majority of the firms of this type are greatly involved with heavy equipment or its movement, and because of the shift of exploration activity North, an Edmonton location for access to the North is advantageous. Reference was made in Chapter III to Edmonton's role as a transportation hub for the movement of equipment

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<sup>5</sup>Pers. interviews with oil offices in Calgary and Edmonton, 1970.

<sup>6</sup>Table 19.



and supplies to the North by land, air, and water.

Refiners, Processors, Marketers and Plant Operators are concerned with the refining of crude oil, the operation of natural gas processing plants for the extraction of propane, butane, natural gasoline and sulphur, and for the marketing of oil, natural gas, and their products. The marked increase of offices of this type in Calgary (Figure 16) is strongly related to the fact that many of these firms are wholly owned by, or affiliated with Producers, Explorers and Developers, the majority of whom are in Calgary. In Edmonton, increase in offices of this type was only minimal throughout the twenty years. However, Edmonton's dominant role as a refining centre has already been emphasized in Chapter III.

Calgary's increasing importance as a centre for the location of offices of Pipeline Companies and Power Distributors (Figure 16) also reflects the fact that many of the firms of this type are owned or controlled by, or joint ventures of Producers, Explorers and Developers in Calgary.

Calgary and Edmonton had a similar number and rate of development of offices of Oilwell Servicing companies from 1954-55 to 1969-70 (Figure 16). Concerning Oilwell Drilling Contractors the two cities had about the same number of offices of this type in 1950-51 and 1959-60. Calgary increased its share of this type between 1954-55 and 1959-60 and thereafter, both cities had a decline (which corresponds



with the "dry spell in major oil discoveries" referred to earlier) but similar pattern of development up to 1969-70.

### Summary

Because of the major discoveries of oil and natural gas in Alberta after 1947, Calgary and Edmonton experienced a remarkable growth of oil offices since that date. From 1950 to 1970 oil offices in the two cities more than quadrupled.

The analysis of the patterns of development of offices, clearly revealed that the two cities are not distinct specialized halves of an oil industry complex. Administrative and oil operations offices are located in both cities. However, very remarkable is the great concentration of administrative oil offices in Calgary. Although Edmonton, undoubtedly, is important as an oil operations centre, nevertheless Calgary had more operations offices, numerically, than Edmonton throughout the study period.

Of the specific oil office types, Calgary consistently has been outstanding in the number of Producers, Explorers and Developers whereas Edmonton has been significant as a centre for Transportation and Oilfield Construction firms.

### LOCATION FACTORS

Three related forms of information were obtained from interviewees about location factors. The first was their



opinions concerning the desirability or necessity of having the offices in the respective city. Second, interviewees were asked to rate various factors related to the present location of their offices. Third, they were requested to state and rank the two or three most important factors which were considered by the firm in the decision to locate in the city. Of the two or three most important factors mentioned, the factor ranked first was given a weight of three, the second two, and the third one. The weights for each factor were totalled according to the number of responses to obtain the total weighted responses.

#### Administrative Oil Offices

The interviewees' opinions concerning the necessity of having their offices located in the respective city are shown in Table 15.

In Calgary, 32 per cent of the interviewees felt it was absolutely necessary for the office to be in Calgary whereas in Edmonton none expressed this view. Very significant is the fact that 97 per cent of the Calgary interviewees expressed the opinions that it was absolutely necessary or highly desirable for their offices to be in Calgary whereas only 37 per cent of the Edmonton interviewees expressed the same opinions for their city. Indeed, 63 per cent of the Edmonton interviewees thought their location in the city was satisfactory but not necessary and that they could just as well be located in Calgary. These results strongly indicate



TABLE 15 - ADMINISTRATIVE OIL OFFICES: INTERVIEWEES' OPINIONS REGARDING THE NECESSITY OF HAVING THE OFFICES LOCATED IN THE CITY

Opinions	Number of Interviewees											
	Calgary						Edmonton					
	*A	C	F	H	All Types No.	%	A	C	F	H	All Types No.	%
Absolutely Necessary	10	-	-	1	11	32	-	-	-	-	-	-
Highly Desirable	15	1	4	2	22	65	6	-	-	1	7	37
Satisfactory but not Necessary	1	-	-	-	1	3	10	1	-	1	12	63
Undesirable	-	-	-	-	-	-	-	-	-	-	-	-
Total	26	1	4	3	34	100	16	1	0	2	19	100

\*  
 A - Producers, Explorers and Developers  
 C - Consultants  
 F - Financial, Investment  
 H - Lease Brokers, Land Agents

Source: Personal interviews, 1970.

that it is highly desirable for administrative oil offices to be located in Calgary and this fact is evidenced by the large number located there.

Table 16 shows the total weighted responses of the two or three most important factors considered by the interviewed firms in the decision to locate their offices in Calgary or Edmonton.

Calgary. The overriding reason for administrative offices locating in Calgary was the desire to be near Producers, Explorers and Developers with a total weighted response of 82 (Table 16). To be noted is that Producers,



TABLE 16 -ADMINISTRATIVE OIL OFFICES: INTER-CITY LOCATION FACTORS

	Total Weighted Responses <sup>1</sup>												
	Calgary							Edmonton					
	All Types							All Types					
	*	A	C	F	H	Total	%	A	C	F	H	Total	%
Desire to be near Producers, Explorers, Developers . . . . .	60	3	12	7	82	45	1	-	-	-	-	1	1
Desire to be near oil and gas fields or to field activities . . . . .	10	-	-	-	10	6	29	3	-	-	-	32	31
Good access to required services and supplies . . . . .	8	-	-	-	8	4	9	-	-	-	-	9	9
Access to banks (Oil and Gas Departments) . . . . .	6	-	-	-	6	3	-	-	-	-	-	-	-
Ready access to government offices <sup>2</sup> . . . . .	2	-	-	1	3	2	10	1	-	2	-	13	13
Good air connections with other cities; <sup>3</sup> good access to the North <sup>4</sup> . . . . .	3	-	-	-	3	2	14	-	-	-	-	14	14
Lack of saturated competition . . . . .										-	3	3	3
Personal--historical . . . . .	51	2	8	8	69	38	22	2	-	5	-	29	29
Total . . . . .	140	5	20	16	181	100	85	6	0	10	-	101	100

\* A - Producers, Explorers, Developers  
 C - Consultants  
 F - Financial, Investment (Oil and Gas Departments of banks)  
 H - Lease Brokers, Land Agents

<sup>1</sup>Each interviewee was asked to state in order of importance the two or three most important factors considered by the firm in its location decision. The first mentioned factor was given a weight of three, the second two and the third one. The weights for each factor were totalled according to the number of responses to obtain the total weighted responses.

<sup>2</sup>Provincial Government offices. For Calgary they include the Oil and Gas Conservation Board, Land Titles Office, and Court House; and for Edmonton they include particularly the head provincial offices.

<sup>3</sup>Applicable to Calgary.

<sup>4</sup>Applicable to Edmonton.

Source: Nickle's Canadian Oil Register



Explorers and Developers themselves ranked this reason as most important, i.e. there was a desire by Producers, Explorers and Developers to be with others of their type. It is highly desirable to examine this need for association in Calgary.

Although Producers, Explorers and Developers are highly competitive nevertheless they also are characterized by a large number of joint ventures or shared activities which are varied in nature. Two or more companies may share the drilling of wells to reduce the high risks and costs involved, or they may form a consortium to search for oil and gas, or share a pipeline or gas processing plant. One company may "farm out" or assign part of its acreage holdings or mineral rights to another in return for a stipulated share of any oil which may be found. To negotiate the various agreements necessitates that companies get together so a location in the same city has great advantages. Another factor which causes Producers, Explorers, Developers to associate is the unitization of oil fields. Seldom is an oil field controlled by just one company; rather it may involve twenty or thirty. Field unitization is an arrangement whereby wells in a field are operated under a common management which permits the application of good engineering practices to the entire field.<sup>7</sup> Therefore, companies must

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<sup>7</sup> In 1957 the Alberta Government amended the Oil and Gas Conservation Act to provide for compulsory unitization where requested by owners of more than 50 per cent of the interest in a pool and if deemed to be in the public interest.



meet to prove their share of production and draw up agreements whereby a pool is operated by one company or a chosen committee. Some companies have personnel who are constantly involved with unitization meetings so the advantages of being together in Calgary are apparent.

The desire to be near Producers, Explorers and Developers is also the major factor in the concentration of Lease Brokers and Land Agents, and Consultant (geological, geophysical, engineering, surveying) and Data Processors in Calgary. Many of the Producers, Explorers and Developers are not large enough to have their own technical consultants, land personnel or computing facilities so must depend on outside professional help.

The second most important location factor was personal-historical with a weighted response of 69. This included such reasons as an early interest in Turner Valley (mentioned by 8 of the 34 interviewees), the owner was born and raised in Calgary, a predecessor company was located in the city, a personal preference for the business and social climate of Calgary, and good access to the recreational facilities of the Calgary region. The mention of the early interest in Turner Valley was not unexpected in view of the fact that 12 of the 34 Calgary sample offices were located in the city prior to 1947 (Table 6).

The third significant factor, a desire to be near oil and gas fields or to field activities, reflects in particular



the exploration activity in Southern Alberta prior to 1947.

The factors which interviewees were asked to rate as very important and somewhat important in the present location of their offices provided some insights about additional factors which influenced firms to locate their offices in Calgary. The results of the responses are shown in Table 1, Appendix C.

In addition to the importance of the desire by administrative offices to be near Producers, Explorers and Developers, and the personal-historical factor, the good air connections with other cities, and access to required services and supplies were also of significance.

Calgary's air connections with the United States, which have always been better than Edmonton's, are of importance because many of the oil firms are linked with oil centres in that country and movement of oil people between Calgary and United States oil centres is considerable.<sup>8</sup> Further evidence of this movement is the fact that Calgary is served by American air carriers whereas Edmonton is not because of insufficient passenger demand.<sup>9</sup>

The location factor access to required services and supplies reflects the large number of Service and Supply offices in Calgary and the need for administrative offices,

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<sup>8</sup> Pers. interviews with oil companies in Calgary and Edmonton, 1970. Also pers. comm. Edmonton International Airport, Area Control Centre, Administration, April, 1971.

<sup>9</sup> Ibid.



especially the Producers, Explorers and Developers, to have contacts with them.

Edmonton. For Edmonton, the prime location factor was the desire to be near oil and gas fields, or to field activities (Table 16). As previously mentioned all but one of the Edmonton offices interviewed located in the city after the 1947 Leduc discovery, and most of them (89 per cent) located prior to 1960 (Table 6). The period 1950 to 1960 was the time when Edmonton had the greatest number of offices of the administrative group, particularly Producers, Explorers and Developers (Table 13). The majority of the Producers, Explorers and Developers who located in Edmonton during the twenty year study period were small companies and for them a location in Edmonton close to the major oil fields would be of advantage. On the other hand, most of the major companies of the Producers, Explorers and Developers type kept their head office in Calgary and established branch offices in Edmonton.

The location of administrative offices in Edmonton, especially the small Producers, Explorers and Developers, can be better understood in light of the fact that the second most important location factor cited by interviewees was the personal-historical one which ranked very close to the first factor. Indeed 11 of the 19 interviewees (8 Producers, Explorers and Developers; 1 Consultant; 2 Lease Brokers and Land Agents) all small companies, started their



oil business in Edmonton and cited personal reasons such as the following for locating in the city: family and community ties; the owner was born and raised in the city or in the Edmonton region; and the owner had a business in the city prior to the establishment of the oil firm.

The third factor, but of considerably lesser importance than the second, was good access to the North, and the fourth one was ready access to Provincial Government offices. Edmonton's importance as a centre for access to the North has already been emphasized in this study. Some of the major Producers, Explorers and Developers have their own private planes for the movement of personnel to the North as well as elsewhere. Access to the head Provincial Government Offices, such as Mines and Minerals, and Lands and Forests is important for such reasons as the need for clarification of regulations governing exploration activity, and the need for permits for seismic and pipeline right-of-ways. Even some of the major Producers, Explorers and Developers interviewed in Calgary, made reference to the many contacts they still have with the Provincial Government offices in Edmonton. Access to the government offices is also of some importance in the location of some consultants in Edmonton who make contacts, expedite services, and supervise field operations for Calgary Producers, Explorers and Developers, especially the independents who do not have a branch office in Edmonton.

In the interviewee rating of location factors as very



important or somewhat important the most significant factors for administrative offices in Edmonton concur with the factors which have just been discussed (Table 1, Appendix C).

### Oil Operations Offices

Table 17 summarizes the interviewees opinions in regard to the necessity of having the offices located in the respective city.

For Calgary 41 per cent thought that a Calgary location was absolutely necessary, and 96 per cent highly desirable or absolutely necessary. For Edmonton only 22 per cent expressed the opinion that their location in the city was absolutely necessary and 76 per cent that it was highly desirable or absolutely necessary. Significant is the fact that 24 per cent in Edmonton considered their location satisfactory but not necessary whereas only 4 per cent in Calgary felt likewise. Therefore, Calgary interviewees felt much more strongly than Edmonton ones that their location was very necessary. The specific types of operations offices in Calgary which expressed the absolutely necessary opinion included Service and Supply, Geophysical and Exploration Drilling Contractors, Oilwell Drilling Contractors, and Pipeline Companies and Power Distributors.

The total weighted responses of the two or three most important inter-city location factors mentioned by interviewees are summarized in Table 18. The results for Calgary and Edmonton will now be analyzed and explained.



TABLE 17 - OIL OPERATIONS OFFICES: INTERVIEWEES' OPINIONS REGARDING THE  
NECESSITY OF HAVING THE OFFICES LOCATED IN THE CITY

Number of Interviewees																			
Calgary										Edmonton									
		*B	I	L	E	G	D	J	All Types No.	%	B	I	L	E	G	D	J	All Types No.	%
Absolutely necessary		6	-	-	-	1	1	1	9	41	6	1	-	1	-	-	-	8	22
Highly desirable		4	1	1	1	1	1	3	12	55	14	2	-	3	1	-	-	20	54
Satisfactory but not necessary		1	-	-	-	-	-	-	1	4	1	1	1	3	-	2	1	9	24
Undesirable		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total		11	1	1	1	1	2	2	4	22	100	21	2	3	4	0	5	37	100

*B - Service and Supply	G - Geophysical and Exploration Drilling
I - Oilwell Servicing	Contractors
L - Transportation and Oilfield Construction	D - Oilwell Drilling Contractors
E - Engineers, Designers, Constructors, Fabricators	J - Pipeline Companies and Power Distributors

Source: Personal interviews, 1970.



TABLE 18-OIL OPERATIONS OFFICES: INTER-CITY LOCATION FACTORS

Factors Mentioned by Interviewees	Total Weighted Responses <sup>1</sup>																		
	Calgary										Edmonton								
	* B	I	L	E	G	D	J	All Types Total %	B	I	L	E	G	D	J	All Types Total %			
Desire to be near Producers, Explorers, Developers	30	3	3	3	3	6	12	63	52	5	-	2	6	-	2	15	7		
Access to other operations offices . . . . .	2	-	1	2	-	-	-	5	4	14	2	-	-	6	-	22	10		
Desire to be near oil and gas fields or field activities . . . . .	4	-	2	-	2	-	6	14	11	48	6	9	9	-	12	89	43		
Access to banks (Oil and Gas Departments <sup>2</sup> ) . . . . .	2	-	-	-	1	4	-	7	6	-	-	-	-	-	-	-	-		
Ready access to government offices <sup>3</sup> . . . . .	-	-	-	-	-	-	-	-	-	2	-	1	-	-	3	6	3		
Good air connections with other cities; <sup>4</sup> good access to the North <sup>5</sup> . . . . .	10	-	-	-	-	2	-	12	10	14	-	2	-	-	1	17	8		
Proximity to the United States . . . . .	1	2	-	-	-	-	-	3	2	-	-	-	-	-	-	-	-		
Lack of saturated competition . . . . .	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-	3	2		
Labor pool . . . . .	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	2	1		
Personal-historical . . . . .	14	-	-	-	-	2	-	18	15	35	3	2	6	-	9	55	26		
Total . . . . .	63	5	6	5	11	12	20	122	100	121	11	17	22	-	28	10	209	100	
* B - Service and Supply	G - Geophysical and Exploration Drilling Contractors																		
I - Oilwell Servicing	D - Oilwell Drilling Contractors																		
L - Transportation and Oilfield Construction	J - Pipeline Companies and Power Distributors																		
E - Engineers, Designers, Constructors, Fabricators																			
<sup>1</sup> Each interviewee was asked to state in order of importance the two or three most important factors considered by the firm in its location decision. The first mentioned factor was given a weight of three, the second two and the third one. The weights for each factor were totalled according to the number of responses to obtain the total weighted responses.																			
<sup>2</sup> Applicable to Calgary																			
<sup>3</sup> For Calgary they include the Oil and Gas Conservation Board, Land Titles Office and Court House, and for Edmonton the head Provincial Government Offices.																			
<sup>4</sup> Applicable to Calgary																			
<sup>5</sup> Applicable to Edmonton																			
Source: Personal interviews, 1970.																			



Calgary. The most important reason by far for the oil operations offices locating in Calgary was the desire to be near Producers, Explorers and Developers (52 per cent). The factor of second importance but much less than the first, was personal-historical (15 per cent) followed by desire to be near oil and gas fields or field activities (11 per cent), and good air connections with other cities (10 per cent). These factors and their rank correspond very closely with those of Table 2, Appendix C, which shows the interviewees' ratings of factors.

The strong desire for oil operations offices to be close to the Producers, Explorers and Developers, the majority of whom are in Calgary, is because of the need for contacts with them for sales and for work. It will be recalled that 96 per cent of the operations office interviewees in Calgary felt that it was absolutely necessary or highly desirable to be located in the city (Table 17); the reason is this need for contacts. The purchasing and engineering departments of the Producers, Explorers and Developers are centralized in Calgary so many Service and Supply firms have located their head or branch sales office in the city and are doing so increasingly. In the first part of this chapter reference was made to the increasing number of Service and Supply firms with head offices in Edmonton who are establishing branch offices in Calgary. Also, small Service and Supply companies which cannot maintain offices



in the two cities because of the expense choose to locate in Calgary to be near the Producers, Explorers and Developers for business. This need of contact for business is a major factor in Calgary's lead over Edmonton in the number of Geophysical and Exploration Drilling and Oilwell Drilling Contractors offices (Figures 15 and 16). Also, certain operations offices providing specialized services for oil companies such as data storage are located in Calgary because of the need for direct contact and rapid service.

The personal-historical factor in the location of oil operations offices in Calgary relates particularly to the oil and gas discoveries and exploration activity in Southern Alberta prior to 1947. Some operations offices in Calgary were established by Americans and some were started by local people to serve the oil activity. Of some significance as a personal factor in the location of offices was the preference by Americans for proximity to the recreational facilities and ranching areas of the Calgary region. The flamboyant spirit of Calgary typified by its renowned annual "stampede" was also cited by interviewees.

The third location factor--the desire to be near oil and gas fields or field activities--reflects Calgary's proximity to the oil activity in its region before Leduc and also to the oil and gas discoveries in Central Alberta after 1947. Greatly improved transportation has given Calgary based operations firms relative ease of access to many of the post Leduc oil and gas fields.



The last significant factor good air connections with other cities relates particularly to Calgary's relatively good access to oil centres in the United States such as Houston and Tulsa. For example, over forty petroleum equipment suppliers and related businesses in Calgary are associated with petroleum firms in Houston<sup>10</sup> and there is considerable movement of personnel between the two centres.<sup>11</sup>

Edmonton. Heading the location factors for oil operations offices in Edmonton was desire to be near the oil and gas fields or field activities (43 per cent). Other significant factors were: personal-historical (26 per cent); access to other operations offices (10 per cent); and good access to the North (8 per cent). The rank of these factors corresponds with the rank of the factors rated by interviewees as very important in their office location as shown in Table 2, Appendix C.

The prime location factor, desire to be near the oil and gas fields and field activities, is explained largely by the fact that the major oil fields of Alberta are in the Edmonton region and in the northwest part of the province. The intense exploration and production activity in the Edmonton region after 1947 created a demand for a multiplicity of services and supplies on a twenty-four hour basis,

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<sup>10</sup>Aviation and Urban Transportation Department, Houston Chamber of Commerce, Houston's Community of Interest With Other Major Oil Producing Areas, Houston, June, 1970.

<sup>11</sup>Pers. interviews with oil operations offices, Calgary, 1970.



so Edmonton rapidly became a centre for oil operations offices. Although Calgary has more Service and Supply offices, nevertheless Edmonton is recognized for its major supply houses and stores, and machine shops as well as large service firms.<sup>12</sup> Interviewees pointed out that Edmonton's emphasis is service-manufacturing whereas Calgary's is service-sales. The major pipeyards in Edmonton are a reflection of the many pipelines which centre on the city. The location of the large refineries in Edmonton is strongly related to the presence of the large oil fields nearby.

Personal-historical factors in the location of oil operations offices include ones such as the owner was raised in Edmonton or its region (8 interviewees), the owner was associated with a non-oil business in the city prior to 1947, or with an oil business after 1947 and started on his own (6 interviewees), the oil office was started in one of the oil boom towns of the Edmonton region (eg., Leduc, Redwater, Drayton Valley) and later moved to Edmonton (4 interviewees), and personal ties to the city (1 interviewee).

In regard to the factor access to other operations offices, all of the Oilwell Drilling and Oilwell Servicing firms interviewed mentioned the need to be near the major supply houses and service companies as one of the reasons for

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<sup>12</sup>In October, 1969, Dresser Industries Incorporated, a major oil industry servicing firm with head offices in Dallas and Houston, Texas, opened a \$28 million Canadian headquarters complex in Edmonton. The new complex brought together the firm's six divisions which had been spread in various parts of the city.



an Edmonton location.

Good access to the North as a location factor reflects Edmonton's important and increasing transportation function as a gateway to the North. Edmonton has a marked advantage over Calgary for offices of firms involved with the movement of heavy oilfield equipment and supplies to the North by land, water, rail and air. The rapidly expanding oil activity in Northern Canada and Alaska is resulting in an increasing use of the Mackenzie waterway for shipment of heavy oilfield equipment and supplies.<sup>13</sup> The concentration of Transportation and Oilfield Construction offices in Edmonton (Figure 16) has already been emphasized.

### Summary

The major factors in the location of the interviewed administrative oil offices in Calgary and Edmonton were:

#### Calgary:

1. Desire to be near Producers, Explorers and Developers.
2. Personal-historical.
3. Good air connections with other cities (particularly with oil centres in the United States).
4. Good access to required services and supplies.

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<sup>13</sup>Northern Transportation Company Limited of Edmonton spent \$12 million early in 1969 on 3 new tugs and 24 new barges bringing its fleet to 20 tugs and 240 barges. During the summer of 1969, the company planned on hauling 265,000 tons of mostly oil industry freight, the bulk of it from the Great Slave Lake Railway railhead at Hay River, down the Mackenzie River. Edmonton Journal, February 4, 1969, p. 63.



5. Desire to be near oil and gas fields or field activities.

Edmonton:

1. Desire to be near oil and gas fields or field activities.
2. Personal-historical
3. Good access to the North (Northern Alberta and Canada).
4. Ready access to the Provincial Government offices.
5. Good access to required services and supplies.

The fact that 97 per cent of the Calgary administrative office interviewees were of the opinion that a location in Calgary was absolutely necessary or highly desirable and that 63 per cent of the Edmonton interviewees felt that their location was satisfactory but not necessary strongly points to the desirability for this oil office group (and in particular the Producers, Explorers and Developers type) to be located in Calgary. The outstanding reason for the concentration of the administrative types in Calgary was the need for contact with and the many interrelationships amongst Producers, Explorers and Developers. However, the major integrated Producers, Explorers and Developers, still find that the location of a branch office in Edmonton is desirable because of the proximity to the main oil and gas fields and because of the good access to the North.

Personal-historical factors have played a significant part in the location of administrative oil offices, most



notably small ones, in both Calgary and Edmonton. For each city, persons living or having a business within the city located their oil office there. Turner Valley and the exploration activity in Southern Alberta before 1947, influenced some administrative offices to locate in Calgary. Hence Calgary's early start was highly significant in influencing other administrative offices to locate in the city.

The important factors in the location of the interviewed operations oil offices in Calgary and Edmonton were:  
Calgary:

1. Desire to be near Producers, Explorers and Developers.
2. Personal-historical.
3. Desire to be near oil and gas fields or field activities.
4. Good air connections with other cities (particularly with oil centres in the United States).

Edmonton:

1. Desire to be near oil and gas fields or field activities.
2. Personal-historical.
3. Access to other oil operations offices.
4. Good access to the North.

Ninety-six per cent of the Calgary operations office interviewees were of the opinion that a location in Calgary was absolutely necessary or highly desirable whereas only 76 per cent of those in Edmonton expressed the same opinion for



their city. Moreover, 24 per cent of the Edmonton interviewees felt that their location was satisfactory but not necessary.

The strongly expressed desire by Calgary oil operations offices to be located in the city is because of the need for contacts with the Producers, Explorers and Developers, for sales and business. Good air connections with United States oil centres was also important in a Calgary location because many firms are American controlled. For Edmonton, the major oil and gas discoveries in its region influenced many oil operations to locate in the city and then with the shift of exploration activities into northwestern Alberta and Northern Canada, access to the North became of importance. The presence of large machine shops, supply stores and service firms attracted some operations offices to Edmonton.

Personal-historical factors were important in the location of operations offices in both Calgary and Edmonton. These factors are essentially the same as those mentioned for administrative oil offices.

#### TRENDS IN THE INTER-CITY LOCATION OF OIL OFFICES

##### Administrative Oil Offices

Since about 1959 Edmonton has experienced a marked decline in the number of Producers, Explorers and Developers offices (Figure 13). An important factor in this decline has



been the move of both head and branch offices of this type to Calgary starting about 1954-55. Table 19 shows that 1954-55 was the year in which there was the greatest number of Calgary head offices of this type with branch offices in Edmonton, a total of 20; by 1969-70 this number had declined to 12. This shift of offices has also been accompanied by a reduction in size of some Edmonton Producers, Explorers and Developers offices with the centralization in Calgary of mainly personnel involved with administrative and technical decision making (eg., managers, geologists, geophysicists, and engineers).<sup>14</sup> This trend is continuing because Shell Oil in March of this year, moved its 300-employee Exploration, Production and Land Division office from Edmonton to Calgary.<sup>15</sup> The D. M. Vipond Company, a small producer, is moving to Calgary this year<sup>16</sup>, and Imperial Oil, the only very large office of this type in Edmonton, will be moving its Production Department (exploration, production and engineering staff) to Calgary about 1972.<sup>17</sup> Factors mentioned by interviewees as responsible for this trend are the improvements in transportation and communications so that field activities

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<sup>14</sup>Pers. interviews with administrative oil offices in Calgary and Edmonton, 1970.

<sup>15</sup>Telephone comm. Shell Canada Limited, Edmonton, February 24, 1971.

<sup>16</sup>Pers. interview D. M. Vipond, Edmonton, November, 1970.

<sup>17</sup>Telephone comm. V. Allen, Imperial Oil Limited, Edmonton, April 14, 1971.



can almost as easily be reached from Calgary as Edmonton, the increasing spread of oil company activities to all parts of Canada, the introduction of and access to computer facilities in Calgary, a desire to have the decision making personnel together, and the need for greater efficiency and reduction of costs.

There has also been a shift of Lease Broker and Land Agent offices from Edmonton to Calgary. Reference already has been made to the decline in offices of this type in Edmonton and the marked increase in Calgary since 1959-60. Lease Brokers and Land Agents interviewed mentioned that although it was very desirable to be near the Provincial Government offices in Edmonton, nevertheless the need for direct contact with the Producers, Explorers and Developers in Calgary for business was of greater importance.

#### Oil Operations Offices

The most marked trend concerning oil operations offices has been the establishment and the centralization in Calgary of sales offices and personnel for Service and Supply firms because of the need for contact with Producers, Explorers and Developers for sales and business. Calgary's increasing number of Service and Supply offices since 1959-60 (Figure 15) is related to this centralization of sales offices in Calgary. Whereas in 1959-60 there were 59 Service and Supply head offices in Edmonton with branch offices in Calgary, by 1969-70 the number had increased to 93 (Table 19).



TABLE 19-OIL OFFICES: HEAD OFFICES IN CALGARY WITH BRANCH OFFICES IN EDMONTON AND HEAD OFFICES  
IN EDMONTON WITH BRANCH OFFICES IN CALGARY, 1950 - 1970

Oil Office Group and Type	1950-51		1954-55		1959-60		1964-65		1969-70	
	H.O.Calg. B.O.Edm.	H.O.Edm. B.O.Calg.	H.O.Calg. B.O.Edm.	H.O.Edm. B.O.Calg.	H.O.Calg. B.O.Edm.	H.O.Edm. B.O.Calg.	H.O.Calg. B.O.Edm.	H.O.Edm. B.O.Calg.	H.O.Calg. B.O.Edm.	H.O.Edm. B.O.Calg.
<u>Administrative</u>										
Producers, Explorers, Developers	9	3	20	1	18	2	12	5	12	2
Consultants-										
Data Processors	2	0	1	1	4	2	6	8	10	15
Financial and Investment	5	0	1	0	3	0	4	0	4	0
Lease Brokers and Land Agents	0	0	2	0	0	2	0	2	0	1
Total Administrative	16	3	24	2	25	6	22	15	26	18
<u>Operations</u>										
Service and Supply	31	8	62	24	83	59	90	65	102	93
Oilwell Drilling Contractors	4	1	12	4	11	1	11	3	15	2
Engineers, Designers, Constructors, Fabricators	-	-	-	-	5	2	6	4	13	11
Geophysical and Exploration	4	0	3	2	10	2	3	0	2	0
Drilling Contractors	-	-	2	1	5	8	8	8	11	7
Oilwell Servicing	-	-	-	-	-	-	-	-	-	-
Pipeline Companies and Power Distributors	1	0	1	0	1	0	6	0	5	1
Refiners, Processors, Marketers, and Plant Operators	0	0	2	0	4	0	3	0	5	0
Transportation and Oilfield Construction	-	-	-	-	-	-	1	6	4	10
Total Operations	40	9	82	31	119	72	128	86	157	124
Total Administrative and Operations	56	12	106	33	144	78	150	101	183	142

Source: Nickle's Canadian Oil Register



Interviewees mentioned that during the period of great oil activity in the Edmonton region from 1947 to 1959, the majority of the business was obtained out of Edmonton. However, now that most of the Producers, Explorers and Developers have centralized their purchasing and engineering departments in Calgary, many of the Edmonton Service and Supply firms have found it necessary to establish a branch office in Calgary and move sales and management personnel to Calgary for sales contacts.

Other factors also are responsible for this trend. Since about 1964-65 the oil industry has experienced a period of slow development so that business for Service and Supply firms has become highly competitive and marked by a decline in prices for services and goods. The direct and rapid contact with Producers, Explorers and Developers is of vital importance for business.

Another factor is that Producers, Explorers and Developers have changed to bulk buying of services and supplies by means of a bidding system. Producers, Explorers and Developers state the need for a specified allotment of services and supplies for as much as an entire year and then Services and Supply firms submit bids. Therefore, proximity to and contact with Producers, Explorers and Developers has become of great concern to many Service and Supply firms. Some of the other oil operations offices also have been affected by these same factors.



## CALGARY'S DEVELOPMENT AS THE OIL ADMINISTRATIVE CENTRE

Calgary, today, is recognized as the administrative centre for the oil industry. To ascertain why Calgary became the oil administrative centre rather than Edmonton, the writer discussed the topic with most of the 112 interviewees many of whom had a large number of years of experience with the oil industry in Alberta and several of whom were with the industry prior to Leduc. Members of the Calgary and Edmonton business communities were also approached for views. A summary of the basic findings are now presented.

A very important factor in Calgary's development as oil administrative centre was its early start and experience with the oil industry. When the Leduc discovery was made near Edmonton in 1947, Calgary, (because of Turner Valley and the exploration activity in Southern Alberta) already was a community very knowledgeable with the oil industry and had a substantial number of Producers, Explorers and Developers as well as experienced personnel such as geologists, geophysicists, land agents and oil brokers (Table 1). Calgarians were involved with the initial Turner Valley discovery in 1914 and with the collapse of the oil boom had lost more than a million dollars worth of savings.<sup>18</sup> In 1919 Imperial Oil located in Calgary<sup>19</sup> and in 1921 its subsidiary Royalite

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<sup>18</sup>E. Gray, Impact of Oil. Toronto, The Ryerson Press and Maclean-Hunter, 1969, p. 10.

<sup>19</sup>Pers. interview, W. E. Smith, Regional Administrative Assistant, Imperial Oil Limited, Calgary, July, 1970.



acquired the Calgary Petroleum Products Company which made the initial Turner Valley discovery. In 1934 the British American Oil Company established themselves in Calgary by purchasing the Bell Refining Company in the city.<sup>20</sup> Imperial Oil and the British American Oil Company contributed funds to Brown of Calgary for the drilling of the important 1936 discovery well in the Turner Valley Field. Shell Oil had two persons in Calgary in 1941 holding leases.<sup>21</sup> In 1944, two geologists from Socony-Vacuum Exploration Company (now Mobil Oil Canada Limited) opened an office in Calgary because they knew Imperial Oil and Shell personnel.<sup>22</sup> The Superior Oil Company (now Canadian Superior Oil Limited) had geologists in Calgary and Edmonton from 1943 to 1946 and because of contacts in Calgary they recommended that an office be opened there; this was done in 1946.<sup>23</sup> Likewise other companies located in Calgary because of previous contacts with persons who were in Calgary and because Producers, Explorers and Developers already were in Calgary. Calgary was the location of independent oil companies such as Home Oil established in 1929 and the British Dominion Oil and Development

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<sup>20</sup>Gulf Oil Canada Limited, Gulf Commentator. Toronto, Vol. 28, January, 1969, p. 23.

<sup>21</sup>Pers. interview, Shell Canada Limited, Calgary, July, 1970.

<sup>22</sup>Pers. interview, B. Taylor, Financial Vice-President, Mobil Oil Canada Limited, Calgary, July, 1970.

<sup>23</sup>Pers. interview, J. Pyle, Treasurer and Controller, Canadian Superior Oil Limited, Calgary, July, 1970.



Corporation (now Asamera Oil Corporation) established in 1925 both of which were started by Calgarians.<sup>24</sup> Before 1947, the desire by oil companies to get together for joint ventures helped to concentrate Producers, Explorers and Developers in Calgary. For example, the McCall-Frontenac Oil Company (Texaco) participated with Union Oil of California between 1941 and 1946 in the drilling of wells.<sup>25</sup> This need for firms to get together was further reinforced after 1947 by the introduction of oilfield unitization and Calgary was the place where the Producers, Explorers and Developers already were located. Also of import in the location of administrative offices in Calgary was the fact that petroleum organizations were first established there<sup>26</sup> so oil people coming into Alberta would go to Calgary to make contacts and to find out what was happening. Thus these oil firms got to know each other in Calgary and also became acquainted with the local people so business and social ties became well established. Therefore, when oil was discovered at Leduc in 1947, the offices had their roots well established in Calgary and rather than moving head offices to Edmonton they opened branch offices instead.

Calgary's proximity to the United States and the

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<sup>24</sup>Pers. interview, July, 1970.

<sup>25</sup>E. J. Hanson, Dynamic Decade: The Evolution and Effects of the Oil Industry in Alberta. Toronto, McClelland and Stewart, 1958, p. 61.

<sup>26</sup>The Canadian Petroleum Association in Calgary has its roots in several groups formed in the city in the 1920s and 1930s.



American influence in Calgary was of significance in its development as the oil administrative centre. Most Canadians look upon Calgary as an Americanized city because of the large number of American citizens who have made it their home.<sup>27</sup> Some came over the trails from the United States with the advent of the ranching industry and with them came the spirit characteristic of the range--the friendliness and willingness to invest and take risks. More came with the discovery of oil and gas at Turner Valley and the exploration activity in Southern Alberta. Calgary was not only the largest centre close to Turner Valley but also to the United States. Therefore the American geologists, geophysicists, drillers, and the executives capable of directing activities, in coming to Alberta located in Calgary which could provide the amenities desired and where a well established group of Americans already resided.<sup>28</sup> Furthermore, Calgary was closer to the Montana oilfields than Edmonton.<sup>29</sup>

The physical and cultural environment of Southern Alberta and the spirit of Calgary characterized by ranching, the cowboy, and the annual "stampede" appealed to the oilmen

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<sup>27</sup>K. Liddell, Alberta Revisited. Toronto. The Ryerson Press, 1960, p. 125. Liddell reports that there are some 30,000 American citizens residing in the area served by the United States consul's office in Calgary.

<sup>28</sup>Loc. cit. Liddell reports that in 1912 there were so many American citizens in Calgary that what is known as Mount Royal, one of the residential areas, was then called American Hill.

<sup>29</sup>Pers. interview, E. LaBorde, President, LaBorde Petroleums Limited, Calgary, August, 1970.



because it was similar to what they had known at home in Texas and Montana. Calgary's proximity to the mountains and Banff for recreation also were an attraction. Calgary was much better known in the United States than Edmonton because of the annual stampede and Banff.<sup>30</sup>

Transportation was an important factor in the development of Calgary as the administrative centre. Most of the administrative oil firms established in Calgary were branch offices of American firms so by 1947 there existed a well established pattern of oil personnel movement between Calgary and American oil cities.<sup>31</sup> Even during the 1950s when the location pattern of oil offices was becoming firmly established for Calgary and Edmonton, travel by road was still a major undertaking and Calgary was 200 miles closer to the United States than Edmonton. Ability to get not only to oil centres such as Dallas, Houston, Tulsa but also to the money markets of New York was better by rail and air from Calgary than Edmonton.<sup>32</sup> Calgary's better air access to American oil centres than Edmonton has already been discussed as a significant factor in the location of administrative oil offices in the city.

By the time of the large oil discoveries in the Edmonton region, the entire Calgary community was much more oriented to oil than Edmonton. Bankers, businessmen, ranchers, and

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<sup>30</sup> Ibid.

<sup>31</sup> Pers. interviews, Calgary, July and August, 1970.

<sup>32</sup> Pers. interview, E. LaBorde, op. cit.



laborers had grown up with Turner Valley and had invested in its development. Calgary had well established brokerage houses and a Stock Exchange (Table 1). In describing the initial 1914 Turner Valley oil boom Hanson states that "Brokerage houses sprang up throughout the city. . . . Most people (Calgarians) with dollars in their pockets strove to get in on the ground floor. . . . The Calgary Stock Exchange had been established . . . in the corner of a local butcher shop".<sup>33</sup> The Calgary banks were well experienced with oil and by 1952 five of them had either oil and gas departments or special oil representatives to serve the needs of the oil industry.<sup>34</sup> Very significant was the establishment in Calgary by the Provincial Government in 1938, of the Alberta Oil and Gas Conservation Board which is the regulatory body of the Alberta petroleum industry. Calgary's experience with oil some thirty years before Edmonton resulted in the development within the city of a body of trained technical and managerial personnel<sup>35</sup> as well as specialists in fields such as petroleum law. The presence of Producers, Explorers and Developers in the city attracted specialty services as well as oilfield service industries (Table 1). Thus by the time

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<sup>33</sup>Hanson, op. cit., p. 44.

<sup>34</sup>Pers. comm. with banks, Calgary and Edmonton, 1970, 1971.

<sup>35</sup>Some of the top executives of major oil companies today, are former Calgarians, for example, F. A. MacKinnon, president of Triad Oil Company Limited, D. E. Mitchell, president of Great Plains Development Company, R. A. Brown, president of Home Oil.



that the 1947 oil boom struck Edmonton, Calgary already was on its way to becoming an administrative oil centre.

The exercise of the various aspects of administration in an oil region requires office accommodation. In this regard Weber states that the city which "provides the greatest amount of office space may find itself in an excellent position to take advantage of the administrative opportunity promised by the oil industry".<sup>36</sup> Following the major oil discovery in 1947, many new oil companies came to Alberta and others expanded so that for several years there was a severe shortage of office space in both Calgary and Edmonton. Any small space could be rented as an office. The Calgary community in keeping with its western spirit was quick to react. Money was invested in new office buildings and unused storage and retail space and older loft warehouses were converted to office use. The Palliser Hotel provided the first office space for numerous oil firms. Thus, during the critical years from 1947 to 1955 when both Calgary and Edmonton were experiencing the greatest influx of oil firms, Calgary with its characteristic strong spirit of promotion did everything possible to accommodate and attract the administrative

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<sup>36</sup> D. Weber, A Comparison of Two Oil City Business Centres (Odessa-Midland, Texas). Chicago, Department of Geography Research Paper, No. 60, University of Chicago, 1958, p. 159.



oil offices, and in this it succeeded. Saarinen<sup>37</sup> points out that between 1953 and 1962 office space in Calgary's central business district almost doubled from 24.5 per cent of the total space to 44.4 per cent.

Edmonton, on the other hand, was slow to react. Persons interviewed in both cities suggested that its slow reaction was due to its lack of experience with oil, its conservative agrarian background, a lack of strong spirit of promotion and a reluctance to have a large influx of American personnel. Edmonton traditionally is a much more conservative city<sup>38</sup> and not as prone to taking risks as is Calgary; this cultural climate, however, is changing. The reluctance to have a large influx of American oil personnel has been suggested to stem from the fact that during World War II, with the construction of the Alaska Highway and Canol Project, Edmonton had an estimated 6,000 U.S. civilians employed by fifty construction firms and in addition a large number of military personnel. With reference to this situation Wonders states:

The psychological impact of the unprecedented rush of activity completely upset the normal routine and so bewildered many citizens that they still speak of those years with amazement. Many of the emergency measures left problems for postwar city government. . . violations

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<sup>37</sup>T. F. Saarinen, The Changing Office Functions in Calgary's Central Business District 1942-62. Unpublished M.A. thesis, Chicago Department of Geography, University of Chicago, 1963, p. 58.

<sup>38</sup>Pers. interview, Dr. E. Roper, mayor of Edmonton 1959-1963, October 30, 1970.



of single family housing zones, unwisely located industrial pockets to hinder orderly urban expansion, degeneration of temporary housing in some instances into slum conditions.<sup>39</sup>

In conclusion, a combination of factors played a part in causing Calgary to become the administrative centre of the oil industry. Most important of all, however, was Calgary's early start and experience with the oil industry. By the time that the major oil discoveries were made at Leduc in 1947 Calgary already was on its way as an oil administrative centre and then the forces of inertia assured its continued development.

#### OIL INDUSTRY LINKAGES BETWEEN CALGARY AND EDMONTON

A study of linkages between Calgary and Edmonton oil industry offices and related Provincial Government offices could form a thesis in itself. However, the purpose of this section is to outline briefly some evidences of the oil office linkages which exist between the two cities.

One important indicator of the inter-city linkages is the head office-branch office ties. Table 19 shows the head offices in Calgary with branch offices in Edmonton and head offices in Edmonton with branch offices in Calgary from 1950 to 1970. It will be noted that for the total administrative and operations offices in 1950 there were 56 head offices in Calgary with branch offices in Edmonton and 12 head offices

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<sup>39</sup>W. C. Wonders, "Repercussions of War and Oil on Edmonton, Alberta," Cahiers de Geographie de Quebec. 3e Annee, (6), 1959, pp. 347-348.



in Edmonton with branch offices in Calgary. Calgary's ties were much stronger with Edmonton than Edmonton's with Calgary. However, by 1970 Edmonton had greatly increased its ties with Calgary; whereas in Calgary there were 183 head offices with branch offices in Edmonton, there were in Edmonton 142 head offices with branch offices in Calgary. If the two 1970 figures for each city are totalled the sum results in 325 head offices in Calgary and Edmonton with the same number of branch offices in the two cities. In addition to these offices there also were head offices in both cities with no branch offices in the other city. The interviewees pointed out that all these offices generate much movement of personnel, correspondence, as well as telephone, telex and telepak calls between the two cities.

Largely because of the need for rapid and efficient movement of oil personnel between Calgary and Edmonton, Pacific Western Airlines in 1963 introduced the "Chieftain" airbus service which today is the only airbus service in Canada. From 1964 to 1970 the passengers carried skyrocketed from 49,000 to 250,000 persons; in the month of January of 1969 it carried 17,688 passengers.<sup>40</sup> As many as 1,000 persons use the airbus on a peak day.<sup>41</sup> The need for contact between and among personnel of the various offices in the

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<sup>40</sup>Pacific Western Airlines, Annual Report, 1968, 1969, 1970.

<sup>41</sup>Loc. cit.



two cities for joint ventures, for unitization meetings, for sales and business, for various services, and for contact with the head Provincial Government offices has been discussed earlier in this chapter. There are companies such as Interprovincial Pipelines which have crude oil shippers' meetings in both cities which involve personnel from as many as twenty different Producers, Explorers and Developers.<sup>42</sup> In regard to the contacts with the Provincial Government offices, for example, major oil companies in Calgary such as Mobil Oil, Sun Oil and Canadian Fina all emphasized that their Calgary office still has many contacts with the Government offices in Edmonton. Other firms interviewed, both of the administrative and operations types, stated that individual persons of the firm used the airbus as much as four days of the week. Some oil personnel also move between the two centres on their company planes.

Interviewees mentioned the intensive use of telephone, and telepak between the two cities. For example, Imperial Oil offices in Calgary and Edmonton are connected by 14 telepak or direct dialling lines which are used almost continuously.<sup>43</sup> Imperial Oil and other oil companies also use a daily truck courier service between Calgary and Edmonton for the movement of seismic records, computer material, and

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<sup>42</sup>Telephone comm. Interprovincial Pipe Line Company, Edmonton, April 6, 1971.

<sup>43</sup>Pers. interview, A. Moss, Imperial Oil Limited, Edmonton, June, 1970.



various parcels.<sup>44</sup>

Inter-urban highway traffic would ordinarily be high between the two largest urban centres in Alberta. The fact that they are the two major oil centres in Canada would increase the degree of ordinary connection. Highway 2 between the two cities carries the highest volumes of traffic of any road in Alberta.<sup>45</sup>

The whole of the topic of oil office linkages between the two centres is one that is still wide open for investigation. The brief evidence gathered suggests that the oil industry interaction between Calgary and Edmonton is high.

#### SUMMARY

The most outstanding factors accounting for the location of oil offices in the two cities are for Calgary the desire to be near Producers, Explorers and Developers because of the need for contacts, and personal-historical factors, and for Edmonton the desire to be near the oil and gas field or field activities and also personal-historical factors.

The most outstanding trends in the inter-city location of oil offices have been the shift of Producers, Explorers and Developers from Edmonton to Calgary and the centralization in Calgary of sales offices and personnel for operations offices, particularly Service and Supply.

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<sup>44</sup>Ibid.

<sup>45</sup>Telephone comm. Alberta Department of Highways Planning Branch, Edmonton, July 28, 1969.



Calgary's development as the oil administrative centre may be attributed primarily to its experience with oil and natural gas throughout some thirty years prior to Edmonton's development as an oil centre. Besides Calgary's early start, other factors such as proximity to the United States and the American influence, its comparatively good transportation access to American oil centres, the attractions of its region, and its initiative in providing office space, all contributed to make Calgary what it is today as an oil centre.

Last of all, the chapter briefly outlined some of the evidence of the oil industry linkages which exist between the two cities. Outside of the statements made by interviewees indicating linkages, the best concrete evidence presented of linkages was the head office-branch office relationships between Calgary and Edmonton. The entire topic needs to be researched much more thoroughly and in greater depth.



## CHAPTER VI

### INTRA-CITY PATTERNS OF OIL OFFICES, 1950-1970, AND LOCATION FACTORS

In Chapter V the inter-city development of oil offices for the twenty-year study period was presented and the factors governing their location were analyzed. This chapter studies the location patterns of oil offices within each city and examines the factors which have been responsible for these patterns.

The location patterns for the twelve types of oil offices for the Central and Non-Central areas of Calgary and Edmonton from 1950 to 1970 are shown on the maps in Appendix D.<sup>1</sup> The Central Area maps show the Standard Distance Parameter or symbol in association with the actual distribution of the oil offices. The intersection of the arms of the standard distance symbol (the x and y axes) indicate the mean centre of the distribution, and the length and directions of the arms indicate the degree (the standard deviation) and directions of dispersal around the mean centre. In other words, the longer the arms the greater the degree of dispersal in those directions.

To obtain information about the intra-city location

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<sup>1</sup>From hereon all references to Figures in Appendix D will be prefixed with a D.



factors each interviewee was asked to give an opinion concerning the desirability or necessity of having the office located where it was within the city, to indicate the favorable and unfavorable factors of the present office location, and to state in order of importance the two or three most important factors considered by the firm in its location decision.

#### ADMINISTRATIVE OIL OFFICES: CALGARY

##### Location Patterns

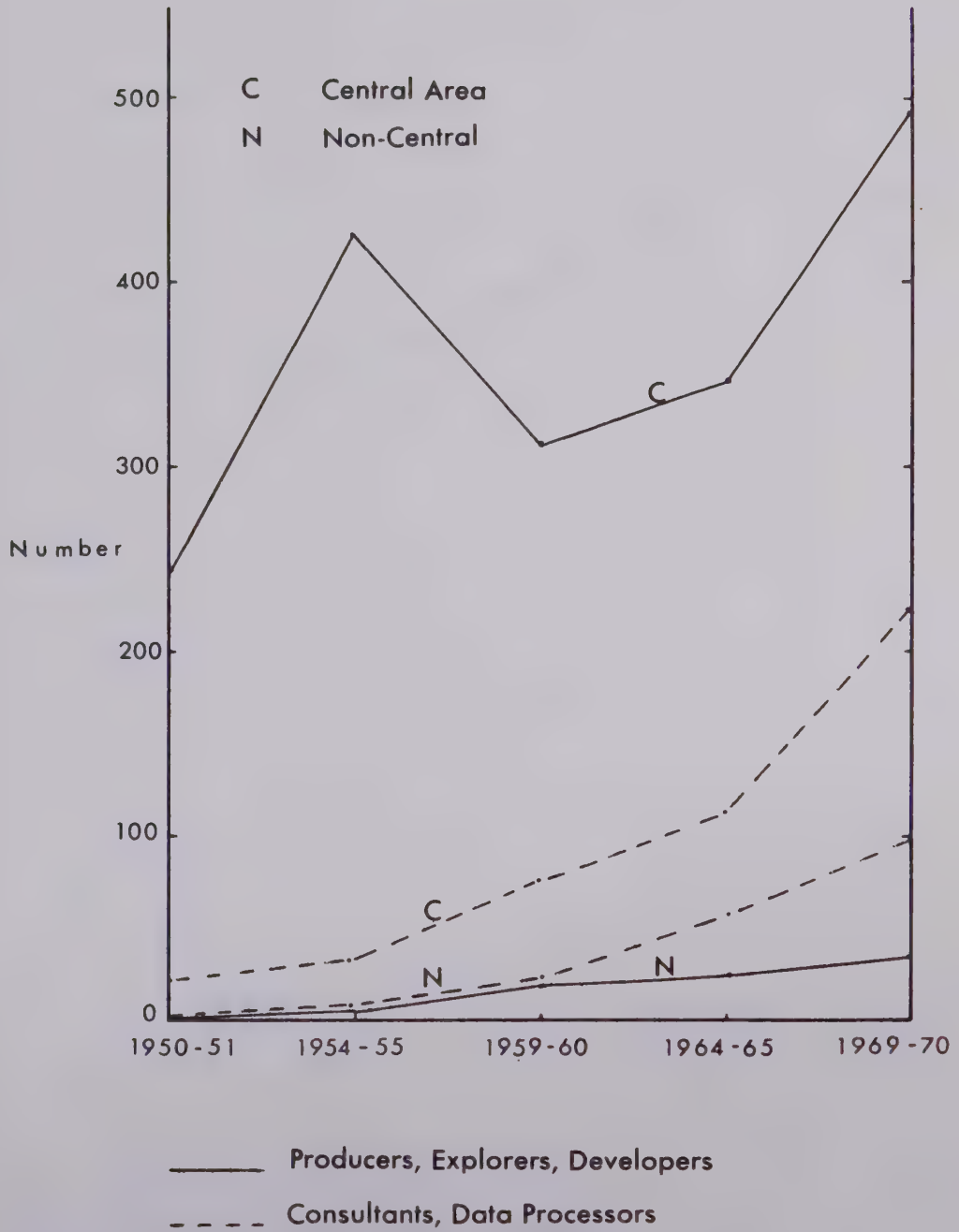
Central Non-Central Locations. The development of administrative oil offices within Calgary from 1950 to 1970 is shown in Figures 17 and 18. Their patterns of location are shown in Figures D.1 to D.40.

Throughout the study period the majority of these offices were located in the Central Area. In 1950-51, there were 311 (97 per cent of the city total) in Central Calgary and in 1969-70, 803 (84 per cent) (Table 20). During this time, all types of the administrative group had 74 per cent or more of their number in the Central Area with the exception of Consultants and Data Processors for 1964-65 and 1969-70.

Producers, Explorers, Developers. Producers, Explorers and Developers had consistently high concentrations of over 90 per cent of the city total in the Central area from 1950 to 1970. However, it will be noted from Figure 17 that in the period 1954-55 to 1959-60 there was a sharp drop in



# ADMINISTRATIVE OIL OFFICES, CALGARY: CENTRAL AREA AND NON-CENTRAL AREA, 1950-1970

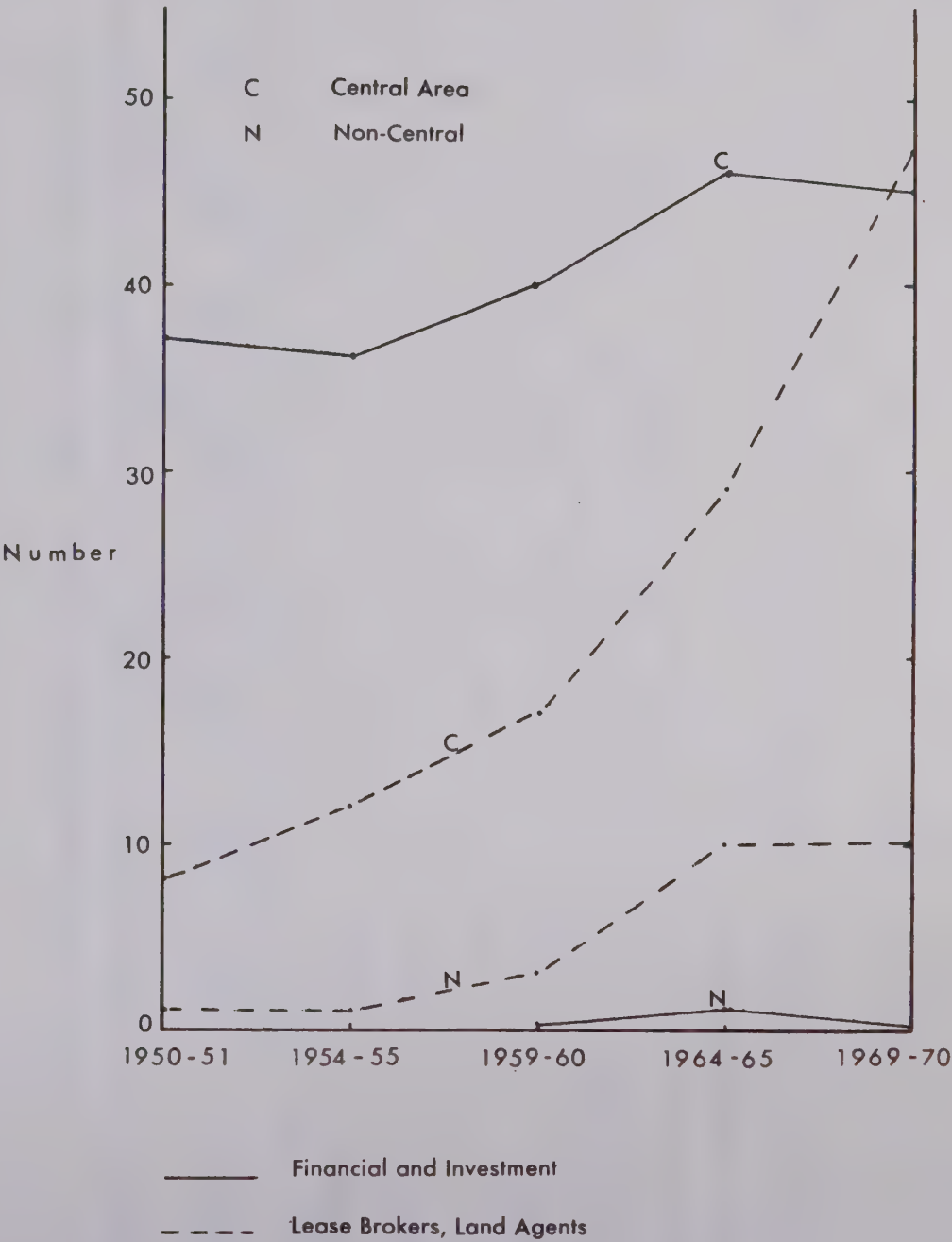


Source: Nickle's Canadian Oil Register

Figure 17



# ADMINISTRATIVE OIL OFFICES, CALGARY: CENTRAL AREA AND NON-CENTRAL AREA, 1950-1970



Source: Nickle's Canadian Oil Register

Figure 18



TABLE 20-ADMINISTRATIVE OIL OFFICES, CALGARY: CENTRAL AREA AND NON-CENTRAL AREA,  
1950 - 1970

Oil Office Type	1950-51				1954-55				1959-60				1964-65				1969-70			
	Central Area		Non-Central Area		Central Area		Non-Central Area		Central Area		Non-Central Area		Central Area		Non-Central Area		Central Area		Non-Central Area	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Producers, Explorers, Developers	244	98	4	2	427	99	5	1	313	93	20	7	346	93	26	7	490	94	34	6
Consultants, Data Processors	22	88	3	12	33	80	8	20	76	78	21	22	112	66	57	34	221	69	98	31
Financial and Investment	37	100	0	0	36	100	0	0	40	100	0	0	46	97	1	3	45	100	0	0
Lease Brokers and Land Agents	8	88	1	12	12	92	1	8	17	85	3	15	29	74	10	26	47	83	10	17
Total and Per Cent of City Total	311	97	8	3	508	97	14	3	446	91	44	9	533	85	94	15	803	84	142	16

Source: Nickle's Canadian Oil Register



number within the Central Area and a small increase in the Non-Central Area. As described in Chapter V, this was the time interval during which many Producers, Explorers and Developers, exited or became dormant and in some cases companies merged. After 1959-60, Producers, Explorers and Developers in Calgary outside the Central Area increased slowly in number but remained about the same as a per cent of the city total. A comparison of Figures D.5, D.7, and D.9 shows that in 1959-60, 1964-65, and 1969-70 the offices of this type in a Non-Central location were quite widely dispersed throughout the city. All were small offices and some were located in homes to keep operating costs low.

Figures D.2, D.4, D.6, D.8, and D.10, show that Producers, Explorers and Developers were clustered in the downtown<sup>2</sup> part of Central Calgary throughout the study period. The standard distances and the standard deviations along the two axes were less for this oil office type than for the other administrative types, with the exception of Financial and Investment offices (Table 1, Appendix E).

An examination of Figure D.11 reveals that between 1950-51 and 1969-70 the mean centre for this office type moved three blocks westward and one block north. The trend for oil office location up to about 1960 was westward along prestigious Eighth Avenue S.W. Interviewees mentioned that

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<sup>2</sup>Downtown Calgary is approximately the area enclosed by the railway tracks, 11 street S.W., the Bow River and 4 Street S.E.



it was thought the westward trend would continue. However, following 1960, there was a shift to the north in oil office location and in the last year or two a marked move to the northeast to the vicinity of Calgary Inn.

Consultants and Data Processors. From 1950 to 1970 the majority of Consultants and Data Processors were located within Central Calgary (Figure 17). However, the Central Area declined in its share of the city total from 88 per cent in 1950-51 to 66 per cent in 1964-65, and then increased its share to 69 per cent in 1969-70 (Table 20).

Those offices located outside the Central Area throughout the twenty years were widely scattered throughout the city showing no tendency to cluster in any particular area (Figures D.12, D.14, D.16, D.18 and D.20). However, the majority in 1969-70 were dispersed throughout Southwest Calgary (Figure D.20).

For the Central Area, there was a tenfold numerical increase of Consultants and Data Processors from 22 in 1950-51 to 221 in 1969-70 (Table 20). A comparison of their location patterns for the study period and the Standard Distance Parameters reveals that in 1950-51 they were quite widely scattered in individual buildings in an east-west alignment, the largest number in any one building being only three. Table 1, Appendix E, shows that from 1950-51 to 1964-65 there was a decline in the standard distance which indicates that for the number involved for each time period there was an



increasing clustering around the mean centre. Also to be noted from the maps is the greater number of offices within individual buildings in 1964-65 and 1969-70 which reflects the addition of new large office buildings during that period. A comparison of all the Standard Distance Parameters (Figure D.22) reveals a greater dispersal of this office type in a north-south direction in 1964-65 and 1969-70 which reflects the northward shift of the location of new office buildings. Throughout the twenty-year period the centre of gravity for the Central Area offices shifted approximately one and one-half blocks westward. (Figure D.22).

Financial and Investment. Throughout the twenty years all Financial and Investment offices, with the exception of one in 1964-65 were located in the Central Area (Figures 18 and D.26). In 1950-51 and 1954-55 they were mostly concentrated along Eighth Avenue S.W. between Centre Street and Sixth Street S.W. (Figures D.23 and D.24). The Standard Distance Parameters show this dominant east-west alignment but also reveal that the mean centre or centre of gravity shifted about one-half block west. By 1959-60 the mean centre had shifted slightly south but the greatest difference from preceding years was the increased standard deviation in a north-south direction indicating a greater dispersal in that direction. The 1964-65 and 1969-70 patterns (Figures D.27 and D.18) show an increased dispersal in an east-west direction and a shift of the mean centre northward



along Fourth Street S.W. These changes are related to an increase in number of Financial and Investment offices and to their location in some of the new office buildings constructed particularly after 1959-60 to the north of Eighth Avenue. The initial westward and more recent northward shift of the centre of gravity for this type of oil office from 1950 to 1970 (Figure D.29) parallels the location trend for Producers, Explorers and Developers.

Lease Brokers and Land Agents. Lease Brokers and Land Agents were mostly concentrated in the Central Area of Calgary throughout the study period (Figure 18 and Table 20). For both 1950-51 and 1954-55 only one office of this type was in Non-Central Calgary and in each case it was the same office located very close to the delimited Central Area boundary (Figures D.30 and D.32). The data year when the greatest proportion of the city total was located outside the Central Area was 1964-65 (Table 20). From 1959-60 to 1964-65 their number within Calgary almost doubled from 20 to 39 and as mentioned in Chapter V, this was the time interval when Lease Brokers and Land Agents who had gained experience working for major Producers, Explorers and Developers, started their own business, some from a residence in a Non-Central location where cost of space was low.<sup>3</sup>

Those offices outside the Central Area for the last three data years were in scattered locations. For those

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<sup>3</sup>Pers. interviews, Calgary, July-September, 1970.



located within the Central Area, the centre of gravity moved first in a northeast direction and then northwest (Figure D.40). In 1950-51 most were located along Eighth Avenue S.W. However, by 1964-65 and 1969-70 the majority were located to the north of Eighth Avenue S.W., which, as with the other administrative oil offices, is related to the location of the new office buildings. The Standard Distance Parameter for 1969-70 shows the greater north-south than east-west alignment. It is of interest to note that for the first three data years the number of offices corresponded very closely with the number of locations; in other words, individual offices tended to be located in separate buildings (Table 1, Appendix E). However, for 1964-65 the 29 offices were at 15 different locations and for 1969-70 the 47 offices were at 26 locations, which indicates that for the last two data years there was an increased concentration of Lease Brokers and Land Agents within individual buildings.

Location Patterns, Summary. Oil offices of the administrative group of firms within Calgary were highly concentrated within the central area and in particular within the downtown part throughout the twenty years of the study period. For each of the specific types, the offices outside the Central Area were widely dispersed throughout the city whereas those within the Central Area were highly clustered. The general trend for the movement of the centre of gravity for all types was westward until about 1959-60 and then there



was a shift to the north particularly because of the new office development for Producers, Explorers and Developers in the vicinity of Calgary Inn.

### Location Factors

Desirability of Location. All of the 34 interviewed administrative oil offices were located in the Central Area of Calgary. Table 21 presents a summary of the interviewees opinions about the desirability of their present office location within the city. The fact that all the interviewees

TABLE 21 - ADMINISTRATIVE OIL OFFICES, CENTRAL CALGARY:  
OPINIONS CONCERNING DESIRABILITY OF BEING LOCATED  
IN THE CENTRAL AREA

Opinions	Number	Per Cent
Absolutely necessary	1	3
Highly desirable	33	97
Satisfactory but not necessary	-	-
Undesirable	-	-
Total	34	100

Source: Personal interviews, 1970.

felt the Central Area location to be either highly desirable or absolutely necessary, suggests that administrative offices need to be in close proximity to one another.

Favorable-Unfavorable Factors. Three factors stand out as being favorable for the location of administrative oil offices in Central Calgary (Table 22). They are: 1) the location facilitates functional linkages with other oil



offices, 2) the face-to-face contacts, and 3) the availability of space within new or suitable buildings. Other favorable factors of some importance were adequate floor space and room for expansion, good public transportation and prestige location.

TABLE 22 - ADMINISTRATIVE OIL OFFICES, CENTRAL CALGARY:  
FAVORABLE FACTORS OF A CENTRAL AREA LOCATION

Favorable Factors	Frequency of Response
Location facilitates functional linkages with other oil offices	31
Close to other establishments of your company	3
Face-to-face contacts	30
Prestige location	12
Adequate floor space and room for expansion	18
Space within a new or suitable building	25
Low rents	6
Good public transportation	15
Close to shopping facilities for employees	12
Adequate parking	7
Little traffic congestion	1
Other factors: proximity to hotels, the Petroleum Club	6

Maximum response possible for each factor is 34

Source: Personal interviews, 1970.

Most of the interviewees thought that there were comparatively few unfavorable factors for a Central Area location (Table 23). The two factors most frequently mentioned were traffic congestion and inadequate parking. Nearly all of the interviewed offices were located within the downtown



area where parking and traffic congestion are problems. These problems are common to many downtowns today. Some of the large offices located in the north part of the downtown area provided free outdoor parking for employees in lots which had been cleared of old houses.

TABLE 23 - ADMINISTRATIVE OIL OFFICES, CENTRAL CALGARY:  
UNFAVORABLE FACTORS OF A CENTRAL AREA LOCATION

Unfavorable Factors	Frequency of Response
Office too far from other establishments of your company	3
High rents	4
Inadequate public transportation	1
Inadequate parking	11
Traffic congestion	16

Maximum response possible for each factor is 34.

Source: Personal interviews, 1970.

Primary Location Factors. The two dominant factors in the location of the administrative oil offices in the Central Area were the need for functional linkages with other oil offices, especially with Producers, Explorers and Developers, and the need for face-to-face contacts (Table 24). If Producers, Explorers and Developers were not located in the Central Area, it is highly unlikely that other types of oil offices would be there.

Amongst administrative oil offices, there are a multiplicity of interrelationships which necessitate face-to-



TABLE 24 - ADMINISTRATIVE OIL OFFICES, CENTRAL CALGARY:  
LOCATION FACTORS

Location Factors	Combined Weighted Responses <sup>1</sup> Central Area
Functional linkages with other oil offices	95
Face-to-face contacts	33
Availability of new or suitable floor space	25
Prestige	14
Proximity to Oil and Gas Conservation Board, Court House, Land Titles Office	9
Accessibility	5
Proximity to Petroleum Club, hotels, restaurants, and shopping facilities	8
Owned land in downtown	4
Number of interviewees	34

<sup>1</sup> Each interviewee was asked to state in order of importance the two or three most important factors considered by the firm in its intra-city location. The first mentioned factor was given a weight of three, the second two, and the third one. The weights of each factor were totalled according to the number of responses to obtain the combined weighted responses.

Source: Personal interviews, 1970.

face communication. This situation makes it highly desirable and even necessary (see Table 21) that they be located close together which results in a high degree of clustering within the Central Area of Calgary. Producers, Explorers and Developers are continually getting together on an individual and group basis for the unitization and the various types of joint venture meetings which were discussed in Chapter V. These meetings involve a variety of professional and technical personnel such as oil company lawyers, geologists, geophysicists, landmen, engineers and



others, and require the use of seismic charts, maps, graphs and highly confidential information. Close spatial proximity has great advantages in assembling the great variety of personnel and materials. Executives of different companies also meet to negotiate top level agreements and these negotiations demand face-to-face contacts. The ability to get together readily on a face-to-face basis is highly desirable to effect the mergers which frequently occur amongst Producers, Explorers and Developers. A location within the Central Area is of great benefit to small Producers, Explorers and Developers who pool their resources and skills for oil activity. Because most of them are too small to have their own technical personnel and specialized facilities, they depend highly upon outside professional help resulting in many contacts with independent Consultants and Data Processors, Lease Brokers and Land Agents. Many of the initial contacts amongst personnel of the administrative oil offices for business purposes are made over a meal. This fact points out the significance of a location in proximity to the Petroleum Club and the quality restaurants many of which are associated with the major hotels in the downtown area. There are also the many financial arrangements which involve person-to-person contacts with Financial and Investment firms. For oil personnel visiting Calgary for business, it is highly desirable that oil firms be close together in order to facilitate contacts. Person-to-person contacts



were emphasized as being very important, especially by small firms, in order to obtain and carry on business.

The third significant location factor for the Central Area was the availability of new or suitable floor space and the fourth one prestige. Producers, Explorers and Developers in particular, mentioned the importance of attractive and air conditioned office space within a prestigious building in part of the Central Area as important in attracting employees of professional status. Good office space is significant in maintaining employee working efficiency.<sup>4</sup> The public image which the company projected was also of concern to some oil offices so the desire for a prestigious location was emphasized by some interviewees.

Two other location factors mentioned by about one-quarter of the interviewees were the proximity to the Oil and Gas Conservation Board, Court House, Land Titles Office and to the Petroleum Club, hotels and restaurants. Reference already has been made to the latter factor. Administrative oil offices' contacts with the Oil and Gas Conservation Board, Court House and Land Titles Office in downtown Calgary are very frequent so ready access is very desirable.

In the discussion of location patterns for Producers, Explorers and Developers, reference was made to the striking

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<sup>4</sup>One large Producer, Explorer and Developer which was interviewed mentioned that the move to a new and prestigious air conditioned office building resulted in a 20 per cent increase in the efficiency of its over 300 employees. The increase in efficiency more than offset the 40 per cent rise in rent.



shift in office location within the downtown from a westward movement to a north-northeast trend in recent years. A number of factors were of particular importance in influencing this development. One was the excessively high cost of land to the west of the central business district core because of real estate speculation based largely on the idea of continued westward office expansion. Another factor was a knowledge of and the partial implementation of an urban renewal scheme in the downtown to the east of Centre Street. A third and highly significant factor was the 1961 decision of the prestigious Calgary Inn to locate at Fourth Avenue and Third Street S.W. (Calgary Inn opened in 1964) in an area of deteriorated housing and outdoor parking; its location influenced the location of several major office buildings such as the Chevron Standard Oil Company building in the block to the southwest, and the large \$25 million Calgary Place Complex across the street to the south.<sup>5</sup> In turn, the location of these buildings had a marked bearing upon additional developments in the area, the most notable one being the \$52 million Bow Valley Square four-tower complex, currently under construction in the block bounded by First Street, Sixth Avenue, Second Street, and Fifth Avenue, S.W.

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<sup>5</sup>Pers. interviews with: S. Raborn, Director, Calgary Inn and President, Canadian Delhi Oil Limited; B. E. Taylor, Financial Vice-President, Mobil Oil Canada Limited (Mobil Tower is one of the two large office buildings of the Calgary Place complex); W. A. Bailey, Controller, Chevron Standard Limited.



The reasons for Calgary Inn's directors choosing to locate in the former area of deteriorated houses were the knowledge of and experience with a similar hotel venture in Houston, Texas, the cost of the land, the ability to provide adequate parking for clients, a knowledge of urban renewal and the recognition that the location was close enough to existing oil offices.<sup>6</sup> Thus the location of Calgary Inn was a very significant factor in shaping the present day location pattern of oil offices in downtown Calgary.

Today, the key area for oil office location is in a triangle with the apex at Prince's Island and the base along Ninth Avenue extending from Palliser Square at Centre Street to Eighth Street S.W. The increased clustering of oil offices within this triangular area of Central Calgary is indicated by the Standard Distance Parameters (the declining standard distance and standard deviations of the two axes) for 1964-65 and 1969-70 (Table 1, Appendix E).

Location Factors, Summary. All of the interviewees of administrative oil offices in Calgary strongly expressed the desirability and necessity of a location within Central Calgary. The three outstanding location factors accounting for the clustering of these offices in the Central Area were the need for functional linkages amongst the offices, the need for face-to-face contacts, and the availability of new or suitable office space. These three factors exactly

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<sup>6</sup>Pers. interview, S. Raborn, Director, Calgary Inn.



paralleled the three most important favorable ones cited by interviewees. The most unfavorable factors of a Central Area location were the traffic congestion and inadequate parking. The decision of Calgary Inn to locate on Fourth Avenue S.W. had a strong bearing upon the northward shift of the location of administrative oil offices away from Eighth Avenue S.W.

#### ADMINISTRATIVE OIL OFFICES: EDMONTON

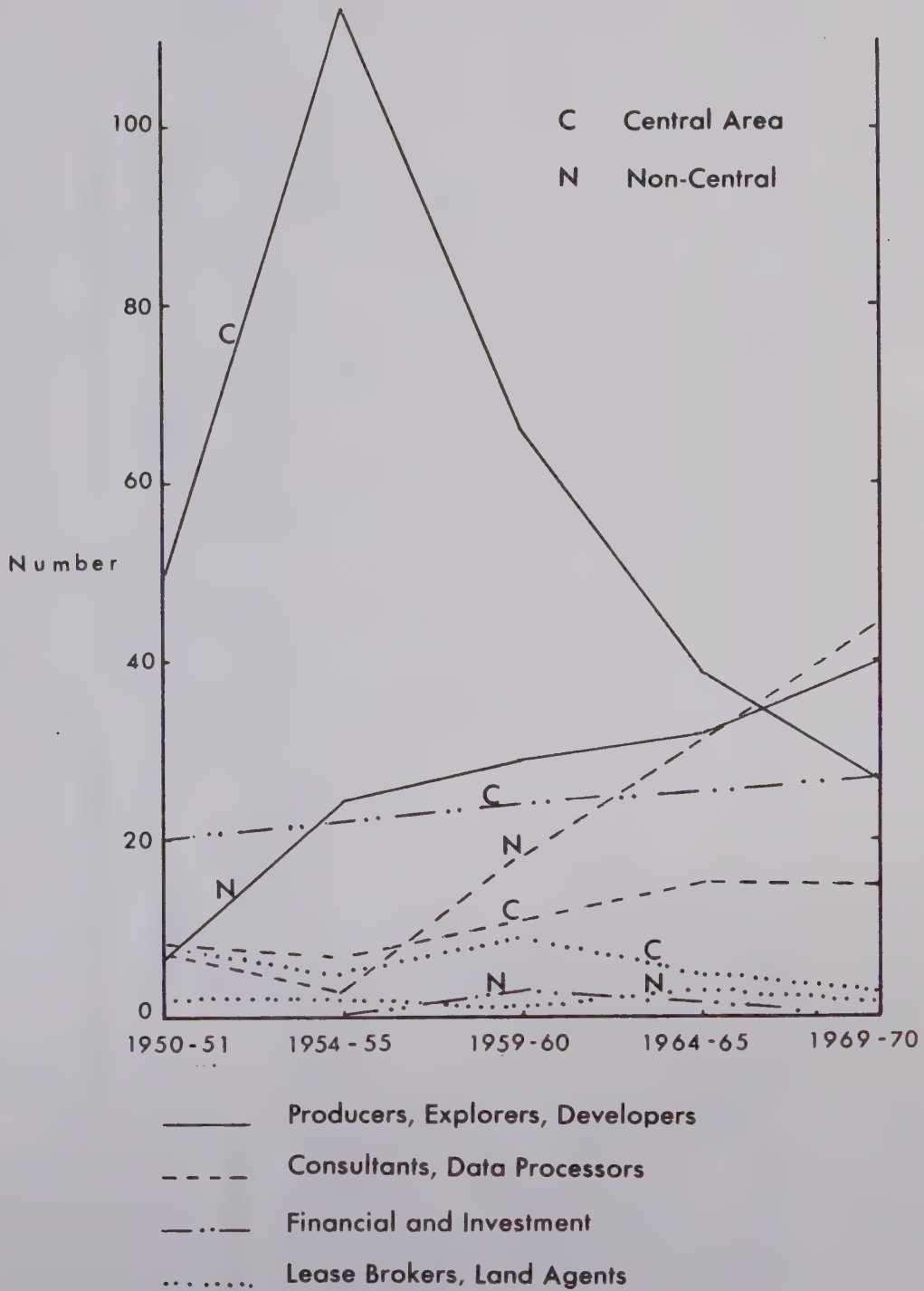
##### Location Patterns

Central Non-Central Locations. The general pattern for Administrative Oil Offices in terms of numbers and per cent of the city total throughout the study period was one of decline for the Central Area and increase for Non-Central Edmonton (Figure 19 and Table 25). However, the one notable exception to this generalization was the remarkable growth of offices in the Central Area during the first five years from 85 to 147.

Producers, Explorers and Developers. In terms of numbers and per cent of the city total, Producers, Explorers and Developers declined within Central Edmonton and increased in the Non-Central Area (Figure 19 and Table 25). However, there was a great increase in number within the Central Area from 1950-51 to 1954-55. This was the time period of major oil discoveries in the Edmonton region and many new firms either started or located in the city, the majority of which chose to locate in the Central Area.



# ADMINISTRATIVE OIL OFFICES, EDMONTON: CENTRAL AREA AND NON-CENTRAL AREA, 1950-1970



Source: Nickle's Canadian Oil Register

Figure 19



TABLE 25-ADMINISTRATIVE OIL OFFICES, EDMONTON: CENTRAL AREA AND NON-CENTRAL AREA,  
1950 - 1970

Oil Office Type	1950-51						1954-55						1959-60						1964-65						1969-70					
	Central Area			Non-Central			Central Area			Non-Central			Central Area			Non-Central			Central Area			Non-Central			Central Area			Non-Central		
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Producers, Explorers, Developers	49	89	6	11	113	82	24	18	66	69	29	31	39	54	32	46	27	40	40	60										
Consultants, Data Processors	8	53	7	47	7	70	3	30	11	37	18	63	15	32	31	68	15	25	44	75										
Financial and Investment	20	100	0	0	22	100	0	0	24	88	3	12	25	92	2	8	27	100	0	0										
Lease Brokers and Land Agents	8	80	2	20	5	71	2	29	9	90	1	10	5	62	3	38	3	60	2	40										
Total and Per Cent of City Total	85	85	15	15	147	83	29	17	110	68	51	32	84	55	68	45	72	46	86	54										

Source: Nickle's Canadian Oil Register



An examination of the location of Producers, Explorers and Developers within Central Edmonton throughout the twenty years (Figures D.42, D.44, D.46, D.48, and D.50) shows that the majority were located within a three block radius of Jasper Avenue and 101 Street which is the general core area of the downtown. The lack of adequate office space was a major problem in the location of administrative oil offices in Edmonton particularly prior to 1960 and the office space that was available was mainly in old buildings within the downtown core. The centre of gravity for Producers, Explorers and Developers in the central Area shifted about one block to the southwest during the twenty years (Figure D.51). Had it been possible to use floor area in calculating the standard distance, the centre would have been somewhat farther west during the last two data years because three major firms occupying a comparatively large amount of office space were located in the west part of the downtown. The general spread of offices was in an east-west direction (Figure D.51). Presently, the only administrative Office in the Central Area with a large amount of office space is a Producer, Explorer and Developer (Imperial Oil) located at Jasper Avenue and 100 Street.

For the Non-Central Area, Producers, Explorers and Developers, throughout the study period tended to be located in two general areas, one being in South Edmonton along 109 Street, 82 Avenue and 104 Street (Calgary Trail) and the



other in North Edmonton along or in the vicinity of 124 Street and Kingsway Avenue near the Municipal Airport (Figures D.41, D.43, D.45, D.47 and D.49). Particularly in 1969-70, about three-quarters of the offices outside the Central Area were largely along 124 Street and Kingsway Avenue.

Consultants and Data Processors. The most significant feature about Consultants and Data Processors was the increase in Non-Central Edmonton from 3 in 1954-55 to 44 in 1969-70 (Table 25). The highest per cent of the city total in the Central Area was in 1945-55 (70 per cent) at the time when the largest number of Producers, Explorers and Developers was located there. After 1954-55 the greatest per cent for each data year was found outside the Central Area (75 per cent in 1969-70).

An analysis of Figures D.53, D.55, D.57, D.59 and D.61 shows that for each of the data years Consultants were quite widely dispersed throughout the Central Area. Indeed, Table 2, Appendix E reveals that the standard deviations along the two axes and the standard distances were greater for this type than for any of the others of the administrative group. Moreover, Figure D.62 shows that the shift of the mean centre was highly irregular.

Outside the Central Area, Consultants were located mainly in South Edmonton during the first three data years along or near 109 Street and 82 Avenue (Figures D.52, D.54, and D.56) and in proximity to some of the Producers,



Explorers and Developers. However, in 1969-70 there was a small cluster of nine offices in North Edmonton along or near 124 Street between Stony Plain Road and 107 Avenue, close to the Producers, Explorers and Developers. Another small group was in South Edmonton located along 104 Street, 63 Avenue and Argyll Road, together with many Service and Supply firms.

Financial and Investment. Throughout the twenty years, almost all of the Financial and Investment firms were located in Central Edmonton (Figure 19 and Table 25) and were grouped within the downtown core along or near Jasper Avenue, 101 Street, 101 A Avenue and 100 Avenue (Figures D.63, D.65, D.66, D.68, and D.69). The clustered pattern is confirmed by the standard distances and standard deviations which were less for this office type than for the others of the administrative group (Table 2, Appendix E). The mean centre during each of the five data years remained within the downtown core area (Figure D.70).

Lease Brokers and Land Agents. Comparatively few Lease Brokers and Land Agents were present in Edmonton during the study period (Figure 19 and Table 25). In 1950-51 and 1959-60 there were ten whereas by 1969-70 they had declined to five. The majority during the first three data years were located within the Central Area and during the last two data years outside the Central Area. Figures D.72, D.74, D.76, D.78 and D.80 for Central Edmonton show that they were least dispersed during 1950-51 and 1954-55. For the



last three data years they were much more spread out as is indicated by the one long Standard Distance Parameter axis. However, it should be noted that because of the small number of offices, one firm can greatly change the direction of an axis as is the case for 1959-60. The movement of the centre of gravity within the Central Area was very irregular although within a distance of about 1,000 feet (Figure D.81). Outside the Central Area, Lease Brokers and Land Agents were widely scattered.

Location Patterns, Summary. During the first three data years, the largest number and per cent of Producers, Explorers and Developers, Consultants, and Lease Brokers and Land Agents in Edmonton were located in the Central Area. During this time Edmonton experienced its greatest oil activity so it was of mutual benefit for these three types to be close together for contact and services. However, with the rapid decline of Producers, Explorers and Developers both in the Central Area and the city, it was of less advantage for Consultants as well as Lease Brokers and Land Agents to have a Central Area location. Therefore, Consultants in particular sought out Non-Central locations in proximity to Producers, Explorers and Developers in North Edmonton and near Service and Supply firms in South Edmonton. Financial and Investment offices stayed predominantly in the Central Area because some of their business was conducted with non-oil firms.



## Location factors

Desirability of Location. Nine of the interviewed administrative oil offices in Edmonton were located in the Central Area and ten were outside the Central Area. The most significant aspect about the opinions of the interviewees concerning the desirability of their location within the city is that 67 per cent of the Central Area offices regarded their location as satisfactory but not necessary and that 60 per cent of the Non-Central Area offices were of the opinion that their location was highly desirable (Table 26). These

TABLE 26 - ADMINISTRATIVE OIL OFFICES, EDMONTON: OPINIONS CONCERNING DESIRABILITY OF INTERVIEWED OFFICES' INTRA-CITY LOCATION

Opinions	Central Area Offices		Non-Central Area Offices	
	No.	%	No.	%
Absolutely necessary	-	-	-	-
Highly desirable	3	33	6	60
Satisfactory but not necessary	6	67	3	30
Undesirable	-	-	1	10
Total	9	100	10	100

Source: Personal interviews, 1970.

results suggest that some of the Central Area administrative offices could just as well be located in a Non-Central location and this indeed was the view expressed by some of the interviewees.



Favorable-Unfavorable Factors. The three most favorable location factors for the Central Area offices were the new or suitable office space, the good public transportation and the adequate floor space and room for expansion (Table 27).

TABLE 27 - ADMINISTRATIVE OIL OFFICES, EDMONTON: FAVORABLE: FACTORS OF INTERVIEWED OFFICES' INTRA-CITY LOCATION

Favorable Factors	Frequency of Response	
	Central Area Offices	Non-Central Area Offices
Location facilitates functional linkages with:		
- other administrative oil offices	1	-
- oil operations offices	-	3
Face-to-face contacts	3	-
Prestige location	2	1
Adequate floor space and room for expansion	6	8
New or suitable office space	8	4
Low rents, suitable lease arrangement	3	8
Good public transportation	8	6
Close to shopping facilities for employees	5	-
Adequate parking	1	10
Little traffic congestion	1	9
Good access to and egress from city	-	2
Close to airport	-	2
Close to Provincial Government offices	2	-
Maximum response possible for each factor	9	10
Source: Personal interviews, 1970.		



For the Non-Central Area offices the most favorable location factors included the adequate parking, the little traffic congestion, the adequate floor space and room for expansion as well as low rents and suitable lease arrangement.

The most significant unfavorable factors for the Central Area offices were the inadequate parking and the traffic congestion (Table 28). Both of these factors were cited by more than half of the offices. Most of the Non-Central offices voiced little or no displeasure with their location.

TABLE 28 - ADMINISTRATIVE OIL OFFICES, EDMONTON: UNFAVORABLE FACTORS OF INTERVIEWED OFFICES' INTRA-CITY LOCATION

Unfavorable Factors	Frequency of Response	
	Central Area Offices	Non-Central Area Offices
Location too far from operations offices	1	-
Lack of face-to-face contacts	-	1
High rents	1	1
Poor public transportation	-	2
Inadequate shopping facilities for employees	-	1
Inadequate parking	5	-
Traffic congestion	5	1
Maximum response possible for each factor	9	10

Source: Personal interviews, 1970.

Primary Location Factors. The most important of the



location factors mentioned by the Central Area and Non-Central Area interviewees (Table 29) corresponded closely with the most important of the favorable factors cited (Table 27).

TABLE 29 - ADMINISTRATIVE OIL OFFICES, EDMONTON:  
INTRA-CITY LOCATION FACTORS

Location Factors	Combined Weighted Responses <sup>1</sup>	
	Central Area Offices	Non-Central Area Offices
Linkages with Central Area offices or Provincial Government offices	8	3
Prestige	3	-
Suitable and available office space	20	9
Functional linkages with Producers, Explorers and Developers	-	3
Good parking, lack of traffic congestion	-	8
Functional linkages with oil operations offices	-	3
Access to Industrial Airport	-	7
Close to shopping facilities, hotels	3	-
Good public transportation, accessibility	16	-
Good access to and egress from the city	-	-
Low rent	-	16
Personal (close to homes of employees)	-	1
Number of interviewees	9	10

<sup>1</sup>Each interviewee was asked to state in order of importance the two or three most important factors considered by the firm in its intra-city location. The first mentioned factor was given a weight of three, the second two and the third one. The weights for each factor were totalled according to the number of responses to obtain the combined weighted responses.

Source: Personal interviews, 1970.



The prime reason for administrative oil offices locating in the Central Area was the suitable and available office space. Reference already has been made to the lack of adequate office space in Edmonton especially prior to about 1960 and it is only within the past ten years that new high-rise office buildings have appeared in Central Edmonton. Indeed, the first of Edmonton's modern office high-rises was the eleven-storied Financial Building completed in 1957 at the corner of 100 Avenue and 107 Street just away from the heart of the downtown. Thus some of the administrative oil offices located in the Central Area mainly because that is the only area that had sufficient modern office space. It will be recalled that two-thirds of the Central Area interviewees felt that the location of the office was satisfactory but not necessary. However, the accessibility of the Central Area for employees, the second most important factor, was also of some significance in a Central Area location.

The third main reason for administrative offices being in the Central Area, the linkages with Central Area offices and Provincial Government offices, was mentioned especially by the Lease Brokers and Land Agents who had many contacts with the Provincial Government offices.

For the Non-Central Area offices the major location factors were low rent, suitable and available office space, good parking and lack of traffic congestion, access to the Industrial Airport and good egress from the city and access



to the site from outside the city. The majority of the Non-Central offices were comparatively small in size and because they had no strong ties with the Central Area, it was of advantage for them to find low-rent space in Non-Central buildings where there was adequate parking and little traffic congestion. Good access to the industrial airport and therefore to the Edmonton-Calgary airbus was a factor of significance to many of the Producers, Explorers and Developers, and some of the Consultants, in locating in North Edmonton in the vicinity of 124 Street and Kingsway Avenue. This location also permitted good egress from the city to field offices in other centres within or near the oil and gas fields. The fact that some consultants supervise field activities and also make contacts in Edmonton for Calgary Producers, Explorers and Developers influenced a number of them to locate in South Edmonton near 104 Street and Argyll Road where rent is low, access to and egress from the city is good, and proximity to many Service and Supply firms facilitates contacts.

Location Factors, Summary. It is important to recognize that two-thirds of the administrative oil offices in Central Edmonton thought that their location within the city was satisfactory but not necessary and that nearly two-thirds of the offices located outside the Central Area felt their location was highly desirable. In other words, most of the Central Area offices did not have strong ties to the Central



Area and the need for them being there was not compelling. The availability of good office space and the accessibility of the Central Area were the two main reasons for them being located there. For the offices in Non-Central Edmonton, it was important to obtain low-rent space with good parking. Some were attracted to the vicinity of the airport in North Edmonton because of the air travel while others found it of advantage to be close to the oil operations offices in South Edmonton.

#### OIL OPERATIONS OFFICES: CALGARY

##### Location Patterns

Central Non-Central Locations. For each of the five data years of the study period more than half of the offices of the oil operations group in Calgary were located in the Central Area (Table 30). Although the Central Area steadily gained in number of operations offices, nevertheless it declined in its share of the city total. On the other hand Non-Central Calgary gained both in number of offices and in its share of the city total from 1950 to 1970.

Service and Supply Offices. For the Central Area, Service and Supply offices from 1950 to 1970 more than doubled in number but declined in per cent of the city total from 85 to 46 per cent (Table 30). The rise in number of offices in the Central Area reflects an increase in the number of sales offices which Calgary and particularly Edmonton firms opened



TABLE 30-OIL OPERATIONS OFFICES, CALGARY: CENTRAL AREA AND NON-CENTRAL AREA  
1950 - 1970

Oil Office Type	1950-51				1954-55				1959-60				1964-65				1969-70			
	Central Area		Non-Central		Central Area		Non-Central		Central Area		Non-Central		Central Area		Non-Central		Central Area		Non-Central	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Service and Supply	116	85	21	15	138	74	49	26	195	59	133	41	218	49	225	51	249	46	288	54
Oilwell Drilling Contractors	21	100	0	0	36	97	1	3	43	91	4	9	26	76	8	24	34	85	6	15
Engineers, Designers, Constructors, Fabricators	-	-	-	-	-	-	-	-	13	65	7	35	30	58	22	42	39	64	22	36
Geophysical and Exploration Drilling Contractors	47	77	14	23	66	67	32	33	51	50	50	50	31	41	44	59	41	46	48	54
Oilwell Servicing	-	-	-	-	7	100	0	0	22	69	10	31	22	52	20	48	21	54	18	46
Pipeline Companies and Power Distributors	5	100	0	0	10	100	0	100	30	97	1	3	52	100	0	0	57	98	1	2
Refiners, Processors, Marketers, and Plant Operators	8	57	6	43	6	60	4	40	16	70	7	30	29	88	4	12	43	86	7	14
Transportation and Oilfield Construction	-	-	-	-	-	-	-	-	-	-	-	-	11	31	24	69	12	24	37	76
Total and Per Cent of City Total	197	83	41	17	263	75	86	25	370	64	212	36	419	55	347	45	496	54	427	46
Source: Nickle's Canadian Oil Register																				

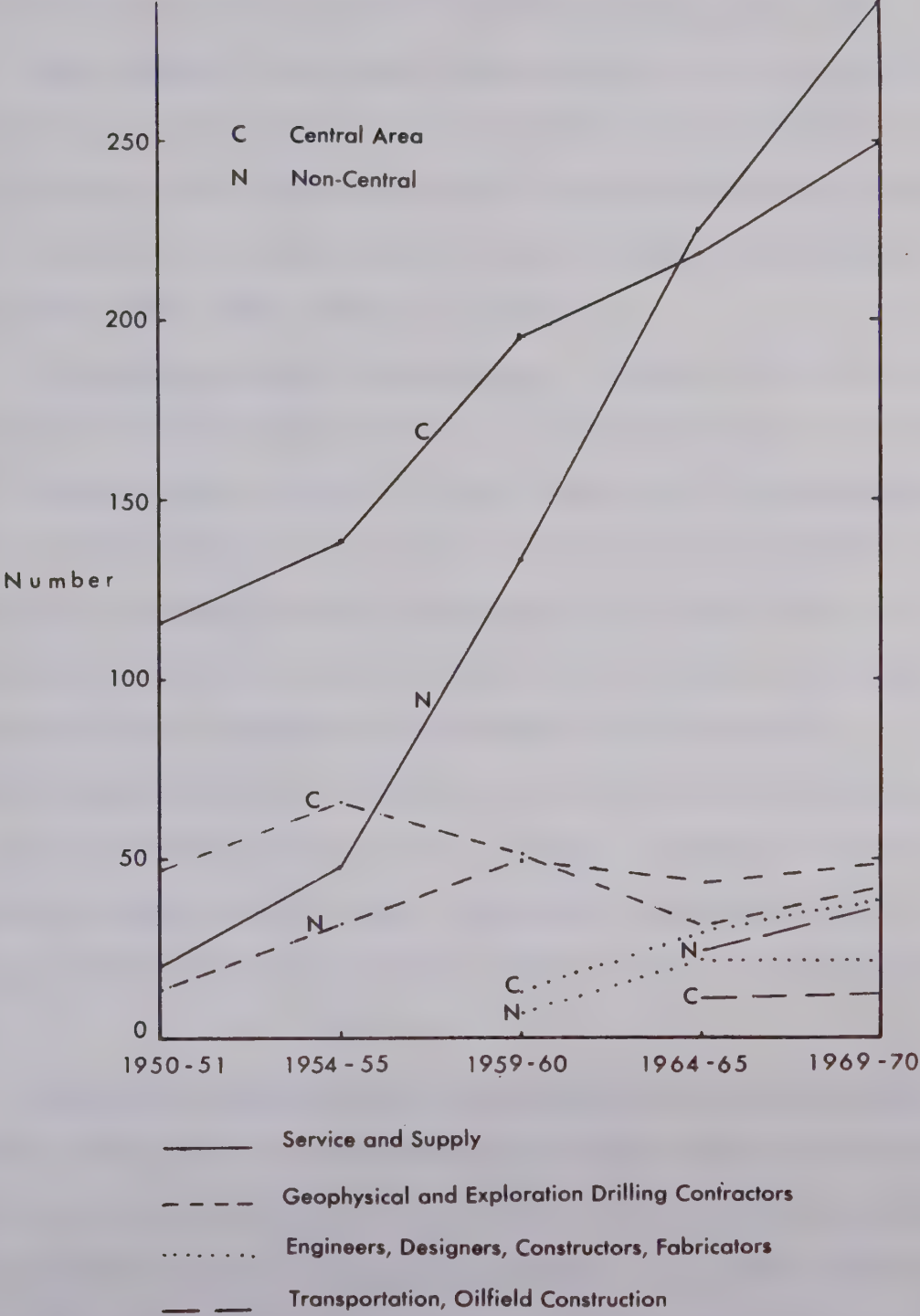


there in order to establish close contacts with Producers, Explorers and Developers. Figure 20 shows that Non-Central Calgary had more Service and Supply offices than the Central Area during the last two data years. Therefore, the significant trend was for offices of this type to locate in Non-Central Calgary. During the earlier years of the study period many of the Service and Supply offices were small sales offices of American companies and located predominantly in the Central Area. However, as the business grew, service shops, warehouses and stores were opened in Non-Central Calgary and in some cases sales offices were left in the Central-Area and operations administration offices were opened in association with the Non-Central establishment. However, in other cases the Central Area offices were moved to the site of the warehouses or service shops.

The location patterns for Service and Supply offices is shown in Figures D.83 to D.91. For Central Calgary, a large number of Service and Supply offices throughout the study period were clustered together in the heart of the downtown area and frequently were located in the same buildings as those occupied by Producers, Explorers and Developers. Others were scattered about outside the heart of the downtown to the east of Centre Street and south of the railway tracks where the location was still central but the cost of space was low in old office and warehouse buildings. The mean centre moved irregularly during the five data years (Figure D.92).



OIL OPERATIONS OFFICES,  
CALGARY: CENTRAL AREA AND NON-CENTRAL AREA,  
1950-1970



Source: Nickle's Canadian Oil Register

Figure 20



Outside of the Central Area, a very marked concentration of Service and Supply offices developed in South Calgary in the general area bounded by 34 Avenue S.E., Macleod Trail, 66 Avenue and Blackfoot Trail (Figures D.82, D.84, D.86, and D.90). Many Oilwell Servicing firms as well as some of the other types of oil offices also located in this general area. This oil operations office district had its beginning during Turner Valley days because of the good access to Highway 2 which leads south toward Turner Valley.

Oilwell Drilling Contractors. Oilwell Drilling Contractors were highly concentrated in Central Calgary throughout the twenty years (Figure 21 and Table 30) and especially in the downtown (Figures D.93 to D.101) in close proximity to Producers, Explorers and Developers. A comparison of the Standard Distance Parameters and the shift of the mean centre for Oilwell Drilling Contractors and Producers, Explorers and Developers (Figures D.102 and D.11) reveals a very close parallel for these two types. Oilwell Drilling Contractors depend solely upon Producers, Explorers and Developers for their business so close contact is highly desirable.

Engineers, Designers, Constructors and Fabricators. Engineers, Designers, Constructors and Fabricators are involved with a great variety of activities which include oilfield inspection, testing, and drilling services, air photo studies, materials and foundation engineering, the design and construction of oil refineries, gas processing plants, gathering and



transmission pipelines, the design and manufacture of oil-field production equipment, and road location studies. Contact with Producers, Explorers and Developers is important so some were located in the Central Area (64 per cent in 1969-70) while others because of the need for shop, laboratory or manufacturing facilities required a Non-Central location (36 per cent in 1969-70). The majority of those in the Central Area were located in the downtown (Figures D.104, D.106 and D.108) while most of the offices in Non-Central Calgary were within the general oil operations district of South Calgary (Figures D.103, D.105, and D.107).

#### Geophysical and Exploration Drilling Contractors.

Geophysical and Exploration Drilling Contractors declined in the Central Area as a per cent of the city total from 77 per cent in 1950-51 to 46 per cent in 1969-70 (Table 30). The Standard Distance Parameters show that they tended to be more widely dispersed during the first three data years than during the last two (Figures D.120). Those located outside the Central Area were quite widely dispersed throughout the city although in 1969-70 a small group was present in South Calgary north of 66 Avenue (Figures D.110, D.112, D.114, D.116, and D.118). Some of the firms of this small group moved out of the downtown to new buildings because of the need for low cost space and in order to consolidate their offices with field equipment facilities and yards. The need for space arose mainly from growth and the introduction of computer facilities.



Oilwell Servicing Offices. Oilwell Servicing offices increased rapidly, numerically, in Central Calgary from 1954-55 to 1959-60 and in the Non-Central Area from 1954 to 1964-65 (Figure 21). Their location trend was similar to that for Service and Supply offices. In 1954-55 all were located in the Central Area but by 1969-70 they were nearly equally divided between a Central Area and Non-Central location (Table 30). Within the Central Area, the offices were present largely in the downtown (Figures D.121, D.123, D.125 and D.127) while in Non-Central Calgary the majority tended to be widely scattered except in 1969-70 when most were located in the oil operations district (Figures D.122, D.124, and D.126).

Pipeline Companies and Power Distributors. The outstanding feature of this office type was the fact that for each of the five data years more than 97 per cent of the city total were located in the Central Area (Table 30) and almost exclusively within the downtown part (Figures D.129 to D.135). Many of these firms are subsidiaries of or are jointly owned by Producers, Explorers and Developers and frequently are administered by some of the same officers and directors. Therefore, their location is strongly governed by the strong ties with Producers, Explorers and Developers.

Refiners, Processors, Marketers and Plant Operators. The most striking feature about Refiners, Processors, Marketers and Plant Operators is the rapid rise in number and per



# OIL OPERATIONS OFFICES, CALGARY: CENTRAL AREA AND NON-CENTRAL AREA, 1950-1970

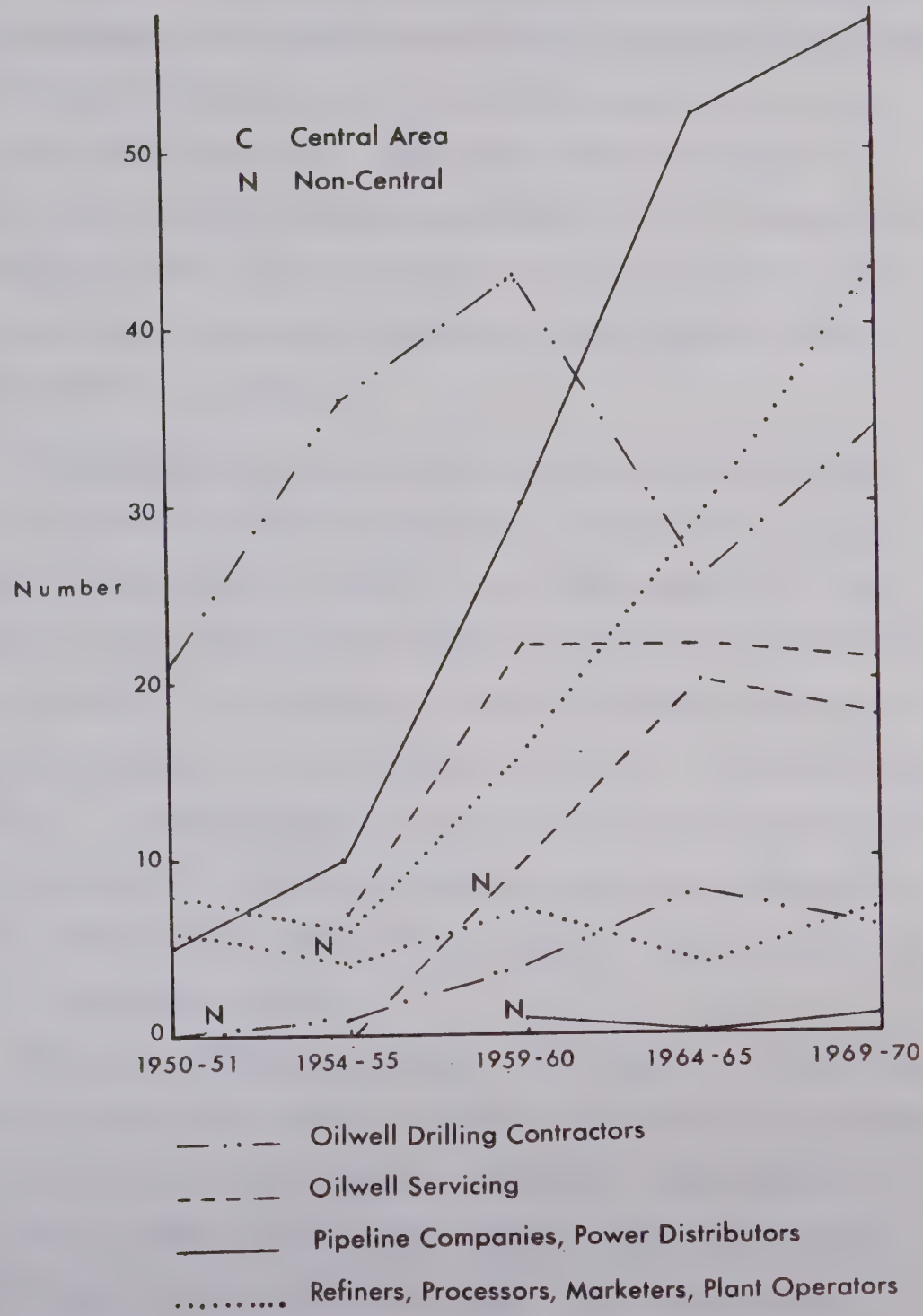


Figure 21



cent of the city total within the Central Area (Figure 21 and Table 30). Because they are involved with the refining of petroleum products, the processing and marketing of liquid petroleum gases, the operation of liquid petroleum gas underground storage caverns, and processing plants, they have strong ties with Producers, Explorers and Developers and therefore show similar location patterns, i.e., the majority are clustered within the downtown of the Central Area and a small number are dispersed throughout Non-Central Calgary (Figures D.137 to D.146).

Transportation and Oilfield Construction Offices.

These offices were located primarily in Non-Central Calgary for 1964-65 and 1969-70, the only two data years for which information about them was available (Figure 20 and Table 30). A small cluster at the airport in North Calgary consisted of firms which operate various types of aircraft (Figures D.148, and D.150). A small group in the vicinity of 42 Avenue S.E. as well as several others in South Calgary were offices of Oilfield Construction firms which require a large amount of space for equipment yards.

Location Patterns, Summary. Throughout the twenty-year study period the majority of the oil operations offices were located in Central Calgary. However, from 1950-51 to 1969-70 the per cent of the city total within the Central Area declined from 83 to 54 per cent. The one specific office type which did experience a considerable gain in per



cent of the city total within Central Calgary was the Refiners, Processors, Marketers and Plant Operators type. In terms of numbers the most outstanding gain in the Non-Central Area occurred with the Service and Supply type which grew from 21 to 288 offices.

Within Central Calgary, most of the offices of the various oil operations types tended to be clustered within the downtown area but some Service and Supply offices also were in scattered locations to the south of the railway and to the east of Centre Street. In the Non-Central Area, the majority of the offices for most types throughout the twenty year period were concentrated within the oil operations district in South Calgary. Those not located in the oil operations district tended to be widely scattered throughout the city.

### Location Factors

Desirability of Location. The analysis of the interviewees' opinions concerning the desirability of their office location revealed that 86 per cent of the Central Area interviewees felt that their office location was highly desirable or absolutely necessary whereas 63 per cent of the Non-Central Area interviewees felt their office location was satisfactory but not necessary (Table 31). Non-Central offices were of the opinion that they could be located elsewhere within Non-Central Calgary but for most of them a Central Area location would present more disadvantages than advantages.



TABLE 31 - OIL OPERATIONS OFFICES, CALGARY: OPINIONS  
CONCERNING DESIRABILITY OF INTERVIEWED  
OFFICES' INTRA-CITY LOCATION

Opinion	Central Area Offices		Non-Central Area Offices	
	No.	%	No.	%
Absolutely necessary	2	14	-	-
Highly desirable	10	72	2	25
Satisfactory but not necessary	2	14	5	63
Undesirable	-	-	1	12
Total	14	100	8	100

Source: Personal interviews, 1970.

Favorable--Unfavorable Factors. The most important favorable location factors for Central Area offices were the facility of functional linkages with administrative oil offices (particularly with Producers, Explorers and Developers), the availability of new or suitable buildings, the face-to-face contacts, the adequate floor space and room for expansion, and good public transportation. For the Non-Central area offices the important favorable location factors (Table 32) were the facility of functional linkages with other oil operations offices, the adequate floor or site space and room for expansion, and adequate parking, all of which were of first rank. Of second rank were the availability of new or suitable buildings, the low rent and the good access to arterial or radial roads.



TABLE 32 - OIL OPERATIONS OFFICES, CALGARY: FAVORABLE  
FACTORS OF INTERVIEWED OFFICES'  
INTRA-CITY LOCATION

Favorable Location Factors	Frequency of Response	
	Central Area Offices	Non-Central Area Offices
Location facilitates functional linkages with:		
- administrative oil offices	14	-
- other oil operations offices	-	6
Close to other establishments of your company	2	2
Face-to-face contacts	11	1
Prestige location	2	-
Adequate floor or site space and room for expansion	10	6
New or suitable building	12	4
Low rent	1	4
Good public transportation	9	1
Adequate parking	4	6
Little traffic congestion	1	3
Good access to arterial and radial roads	-	4
Maximum response possible for each factor	14	8

Source: Personal interviews, 1970.

The most unfavorable location factors (Table 33) pointed out by interviewees of Central Area offices included the traffic congestion and the inadequate parking whereas for the interviewees of Non-Central offices they included the poor public transportation and the distance of the office from other establishments of the company. On the whole, the



Central Area interviewees had fewer complaints about their location than the Non-Central ones.

TABLE 33 - OIL OPERATIONS OFFICES, CALGARY: UNFAVORABLE FACTORS OF INTERVIEWED OFFICES' INTRA-CITY LOCATION

Unfavorable Location Factors	Frequency of Response	
	Central Area Offices	Non-Central Area Offices
Location too far from administrative oil offices	-	2
High rents	1	-
Traffic congestion	5	1
Too far from other establishments of the company	-	3
Lack of face-to-face contacts	-	2
Inadequate floor space	-	2
Obsolescence of building, site too small	-	1
Poor public transportation	-	3
Inadequate parking	3	1
Maximum response possible for each factor	14	8

Source: Personal interviews, 1970.

Primary Location Factors. The overriding reason for the location of oil operations offices in the Central Area of Calgary (Table 34) was the functional linkages or need for contact with administrative oil offices, especially with Producers, Explorers and Developers. The second most important factor was the face-to-face contacts. It should be noted that these most important factors for Central Area offices



correspond closely with the most frequently cited favorable factors of Table 32.

TABLE 34 - OIL OPERATIONS OFFICES, CALGARY:  
INTRA-CITY LOCATION FACTORS

Location factors	Combined Weighted Responses <sup>1</sup>	
	Central Area Offices	Non-Central Area Offices
Functional linkages with:		
- administrative offices	41	2
- oil operations offices	-	6
Face-to-face contacts	18	-
Close to other establishments of the company	2	-
Availability of land or space in a good industrial area	-	11
Low cost of rent or land	1	9
Good access to arterial or radial roads	-	4
Access to railway trackage	-	2
Adequate parking	-	2
Within central area but out of down- town	3	-
Proximity to Oil and Gas Conservation Board, hotels	5	-
New or suitable building, adequate space	12	5
Near the Central Area	-	6
Personal	2	1
Number of interviewees	14	8

<sup>1</sup> Each interviewee was asked to state in order of importance the two or three most important factors considered by the firm in its intra-city location. The first mentioned factor was given a weight of three, the second two, and the third one. The weights for each factor were totalled according to the number of responses to obtain the combined weighted responses.

Source: Personal interviews, 1970.



Interviewed Oilwell Drilling firms stressed more strongly than any of the other oil operations types the importance of close contacts and on a face-to-face basis with Producers, Explorers and Developers in order to obtain business. These two reasons primarily account for the high concentration of Oilwell Drilling offices in the Central Area and largely explain the location of most of the other oil operations offices in Calgary's Central Area. In order to obtain business, Service and Supply and Oilwell Servicing firms find the face-to-face contacts with Producers, Explorers and Developers of great necessity because of increasing competition resulting from the slow down of oil exploration in Alberta, and because of the change by some Producers, Explorers and Developers to a bidding system for work contracts. The bidding system was discussed in a previous chapter. The fact that Pipeline Companies and Power Distributors, and Refiners, Processors and Marketers have strong ties with Producers, Explorers and Developers was already mentioned as a very important reason for their concentration in the Central Area. Some of the oil operations offices found it of advantage to locate just outside the general central business district part of the Central Area where access to the business contacts was still good but the cost of space was much less.

The basic location factors for the Non-Central Area oil operations were the availability of space in a good



industrial area, and the relatively low cost of this space. Also of some importance were the functional linkages with other oil operations offices, the adequate space for expansion, and the good access to arterial or radial roads. All of these factors played a role in the clustering of oil operations offices in South Calgary in the vicinity of 42 Avenue S.E., Macleod Trail, 66 Avenue and Blackfoot Trail. Adequate and comparatively low cost space or land was available for warehouses, shops, equipment storage yards and truck docking facilities. There was good access to Macleod Trail connecting with Highway 2 south, to Blackfoot Trail connecting with Highway 2 north, and the Trans Canada Highway east, and to 66 Avenue and Glenmore Trail leading to the Trans-Canada Highway west. Oil operations offices depend upon one another to a degree for various services and supplies and therefore a location in proximity to one another has advantages. A number of offices also located near the Central Area where adequate space was still available and contact with Central Area offices could still be made without too great of an inconvenience.

Location Factors, Summary. More than four-fifths of the interviewees representing Central Area oil operations offices were of the opinion that their office location was highly desirable or absolutely necessary whereas only one-fourth of the ones representing Non-Central offices thought likewise. The most compelling reasons for a Central Area



location were the functional linkages and the face-to-face contacts especially with Producers, Explorers and Developers. Oil operations offices were attracted to a Non-Central location primarily because of the availability of low cost space in a good industrial area. The functional linkages with other oil operations offices and good access to arterial or radial roads were additional factors accounting for the location of oil operations offices in South Calgary.

#### OIL OPERATIONS OFFICES: EDMONTON

##### Location Patterns

Central Non-Central Locations. Throughout the study period the majority of the oil operations offices in Edmonton were located in the Non-Central Area (Figures 22 and 23). In 1950-51 the Non-Central Area had 62 per cent of the city total of the oil operations group and in 1969-70, 88 per cent (Table 35). There was relatively little change in the number of offices within the central area throughout the period with the highest figure being 97 in 1959-60. Thus most of the oil operations office development occurred in the Non-Central Area and it will be stressed in the analysis.

Figures 22 and 23 show that for most of the specific office types of the operations group the number within the Central Area increased slowly from 1950-51 to 1959-60 and then declined thereafter whereas the number within the Non-Central Area increased substantially throughout the twenty



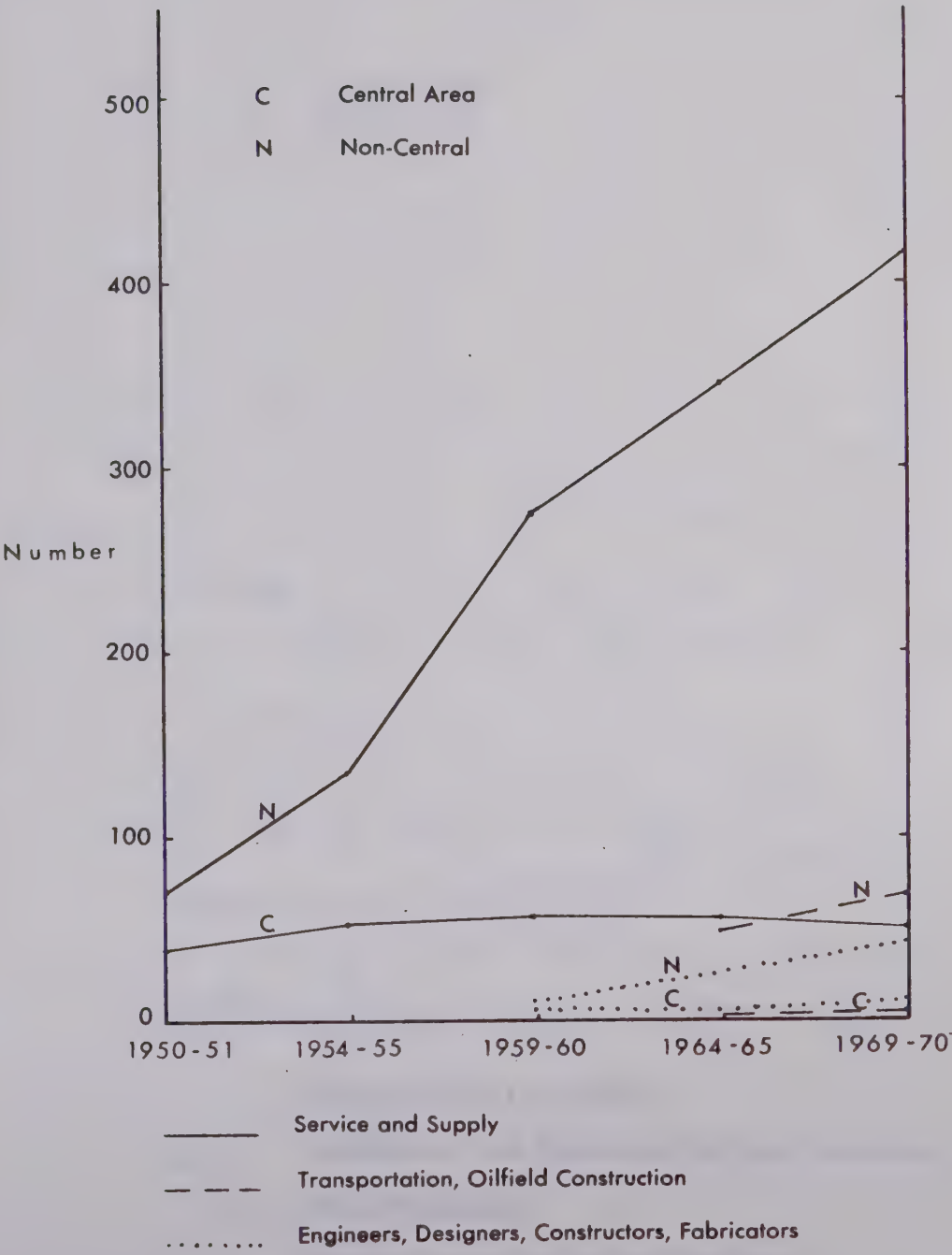
TABLE 35-OIL OPERATIONS OFFICES, EDMONTON: CENTRAL AREA AND NON-CENTRAL AREA,  
1950 - 1970

Oil Office Type	1950-51				1954-55				1959-60				1964-65				1969-70			
	Central Area		Non-Central		Central Area		Non-Central		Central Area		Non-Central		Central Area		Non-Central		Central Area		Non-Central	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Service and Supply	40	36	70	64	53	28	137	72	58	17	278	83	57	14	347	86	53	11	416	89
Oilwell Drilling Contractors	10	48	11	52	16	44	20	56	4	15	22	85	0	0	20	100	0	0	25	100
Engineers, Designers, Constructors, Fabricators	-	-	-	-	-	-	-	-	9	45	11	55	9	24	29	76	11	21	42	79
Geophysical and Exploration Drilling Contractors	8	25	24	75	12	36	21	64	7	22	25	78	2	13	13	87	0	0	8	100
Oilwell Servicing	-	-	-	-	2	15	11	85	8	22	29	78	5	16	27	84	3	9	32	91
Pipeline Companies and Power Distributors	6	86	1	14	6	100	0	0	5	50	5	50	8	44	10	56	9	60	6	40
Refiners, Processors, Marketers, and Plant Operators	3	43	4	57	4	50	4	50	6	35	11	65	2	15	11	85	4	22	14	78
Transportation and Oilfield Construction	-	-	-	-	-	-	-	-	-	-	-	-	6	11	50	89	6	8	70	92
Total and Per Cent of City Total	67	38	110	62	93	33	193	67	97	20	381	80	89	15	507	85	86	12	613	88

Source: Nickle's Canadian Oil Register



OIL OPERATIONS OFFICES,  
EDMONTON: CENTRAL AREA AND NON-CENTRAL AREA,  
1950-1970

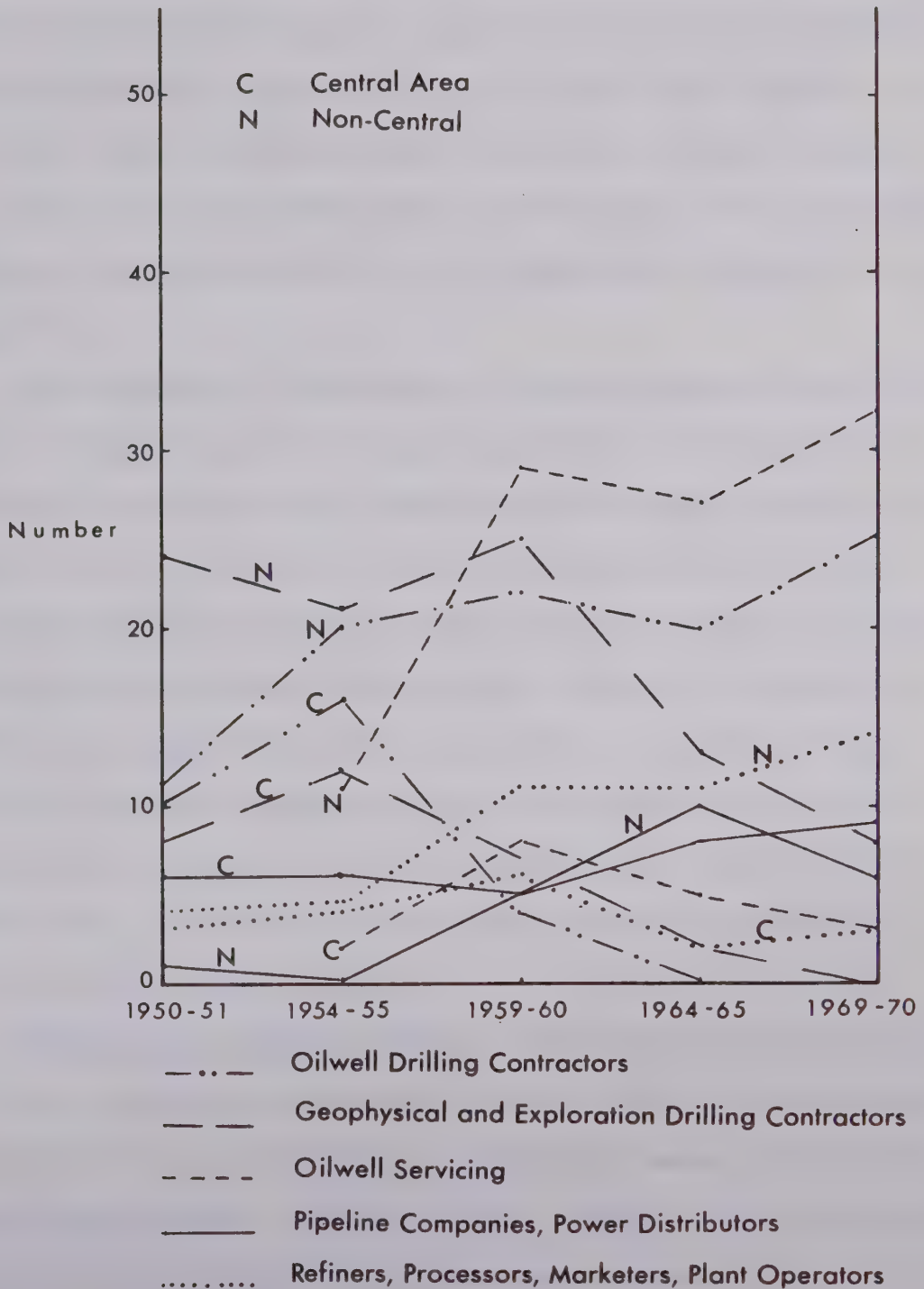


Source: Nickle's Canadian Oil Register

Figure 22



# OIL OPERATIONS OFFICES, EDMONTON: CENTRAL AREA AND NON-CENTRAL AREA, 1950-1970



Source: Nickle's Canadian Oil Register

Figure 23



years, especially for Service and Supply offices.

From 1950-51 to 1959-60, there were distinct advantages for some oil operations offices to be in the Central Area because it was during that time interval that the greatest number of Producers, Explorers and Developers were present in Edmonton, the majority of which were located in the Central Area. However, with the rapid decline of Producers, Explorers and Developers in Edmonton, the advantages of a Central Area location for oil operations offices declined greatly.

An analysis of the Central Edmonton maps reveals that there were comparatively few oil operations offices present throughout the study period and that most types tended to be dispersed within the area. The two types which were the least spread out were Oilwell Drilling Contractors and Pipeline Companies and Power Distributors (Table 4, Appendix E). Both of these types are either related to or have strong ties with Producers, Explorers and Developers the majority of which were clustered in downtown Edmonton until 1964-65 (Figures D.42, D.44, D.46, D.48 and D.50) and therefore tended to locate close to them.

Service and Supply Offices. Throughout the entire twenty-year period approximately 70 per cent of all the oil operations offices in Non-Central Edmonton were of the Service and Supply type. Figures D.153, D.155, D.157, D.159 and D.161 show the striking development and concentration of this



type in South Edmonton along and near 104 Street and the extension eastward along 63 Avenue and Argyll Road. It is here that the major supply warehouses and stores and machine shops are located. A more recent development since about 1964-65 has been the location of Service and Supply firms in the new Marathon Industrial Park to the east of Calgary Trail in the vicinity of 40 Avenue. The need for expansion is causing some firms to move from the congested 104 Street area to the new industrial park as well as to the area south of 63 Avenue.

The earliest development of this South Edmonton oil operations district occurred along 104 Street (known as the "oil patch") just after the Leduc oil discovery in 1947. One hundred and fourth Street was the main artery connecting with Highway 2 south to Leduc and Calgary. However, as the majority of the sites in the 104 Street area became occupied, development shifted eastward along and to the south of 63 Avenue and then eventually to Argyll Road.

By 1959-60 a second important oil operations office district had emerged in Northwest Edmonton west of 142 Street between 111 Avenue and 127 Avenue and the majority of the firms locating there were Service and Supply (Figure D.157). Also to be noted is a second grouping of Service and Supply offices in Northwest Edmonton east of 124 Street and north of Stony Plain Road extending to the Industrial Airport (Figures D.157, D.159, and D.161). Service and Supply as



well as other oil operations offices started to locate in Northwest Edmonton after 1954-55 because of the discovery of major oil fields to the west and northwest of the city. Egress from this part of the city was better than from the South Edmonton area.

Oilwell Drilling Contractors. Throughout the study period more than half of the Oilwell Drilling Contractors were located outside the Central Area and for 1964-65 and 1969-70 all were in a Non-Central location (Table 35). Figures D.164, D.166, and D.168 show that during the first three data years the majority were located in the vicinity of 82 Avenue and 104 Street South. By 1969-70 most had shifted southward to the 63 Avenue and Argyll Road district (Figure D.171).

Engineers, Designers, Constructors, Fabricators. For the three data years for which information was available, offices of this type increased in the Non-Central Area from 55 per cent of the city total in 1959-60 to 79 per cent in 1969-70 (Table 35). For the last two data years the majority were located in the oil operations district near 63 Avenue (Figures D.175 and D.177). It is of interest to note that in 1969-70 a small cluster of ten offices were present near 107 Avenue and 124 Street (Figure D.177), close to where Producers, Explorers and Developers have also located (Figure D.49).

Geophysical and Exploration Drilling Contractors. Geophysical and Exploration Drilling Contractors declined greatly



in Edmonton during the study period and by 1969-70 there were only eight, all of which were located in Non-Central Edmonton (Table 35). Throughout the study period they tended to be scattered throughout the city (Figures D.180 to D.188).

Oilwell Servicing. For each of the data years more than 75 per cent of the Oilwell Servicing offices were in the Non-Central Area (Table 35) and were almost exclusively concentrated in the South Edmonton oil operations district amongst the Service and Supply firms upon which they depend for supplies (Figures D.190, D.192, D.194 and D.196). They increased numerically in the Non-Central Area during the study period.

Pipeline Companies and Power Distributors. During the entire study period there were few of this oil office type in Edmonton (Table 35). For the Non-Central Area in 1950-51, 1959-60 and 1964-65 they were widely scattered (Figures D.199, D.202, and D.204). In 1969-70, five were located along 124 Street close to or with Producers, Explorers and Developers (Figure D.206).

Refiners, Processors, Marketers and Plant Operators. Refiners, Processors, Marketers and Plant Operators were few in number throughout the study period and were widely scattered within Non-Central Edmonton (Figures D.209, D.211, D.213, D.215 and D.217). However, with reference to Refiners, recognition must be given to the fact that the refining complex along Highway 16A just east of the city boundary in the



Municipal District of Strathcona, will in 1971 have 77 per cent of the total refining capacity in Alberta and 33 per cent of the total refining capacity in Western Canada (see Chapter III). The location of this complex is governed by the need for large tracts of land at a moderate cost, and the need to be downwind from the city because of the obnoxious odors. The tank farms of some of the Pipeline Companies also are located in the general area of the refineries for the same basic reasons.

Transportation and Oilfield Construction. For this oil office type data were available only for 1964-65 and 1969-70 and for these two data years 89 and 92 per cent of the offices respectively were in Non-Central Edmonton (Table 35). A comparison of Figures D.220 and D.222 reveals that for 1964-65 they tended to be scattered throughout the city although most were in South Edmonton. By 1969-70 there was a definite concentration in the oil operations district and there were two smaller groups in Northwest Edmonton, one near 111 Avenue and 142 Street, and the other at the airport. Those at the airport were primarily firms concerned with air transport.

Location Patterns, Summary. The majority of oil operations offices in Edmonton for each of the five data years were located outside the Central Area and the largest type by far, numerically, was Service and Supply. There was a remarkable clustering of oil operations offices in South Edmonton



in the vicinity of 104 Street, 63 Avenue and Argyll Road particularly during the last two data years. A second but comparatively small oil operations district developed in Northwest Edmonton to the west of 142 Street and north of 111 Avenue. A small number of oil operations offices also were located near 124 Street and in proximity to the airport. Outside of these areas they tended to be widely dispersed throughout the city.

For the Central Area of Edmonton, the number of offices of the oil operations group was less than one hundred for each of the five data years. In regard to location patterns, all types in general were dispersed within this area.

### Location Factors

Desirability of Location. For both the Central and Non-Central Area, about half of the interviewees thought that their office location was highly desirable and approximately half felt it was satisfactory but not necessary (Table 36). Of the two Central Area offices which expressed a highly desirable opinion, both required good office space and a location with good accessibility for employees. For the Non-Central offices some felt that they could just as well be located elsewhere but with general proximity to other oil operations offices.



TABLE 36 - OIL OPERATIONS OFFICES, EDMONTON: OPINIONS  
CONCERNING DESIRABILITY OF INTERVIEWED OFFICES'  
INTRA-CITY LOCATION

Opinions	Location of Interviewed Offices			
	Central No.	Area %	Non-Central No.	%
Absolutely necessary				
Highly Desirable	2	50	15	45
Satisfactory but not necessary	2	50	18	55
Undesirable				
Total	4	100	33	100

Source: Personal interviews, 1970.

Favorable - Unfavorable Factors. The most favorable location factors for the Central Area offices related to the availability of office space and to the accessibility of the Central Area (Table 37). For the Non-Central Area offices the significant favorable location factors were the functional linkages with other oil operations offices, the new or suitable floor space available and room for expansion, the adequate parking and lack of traffic congestion, and the good access to arterial and radial roads (Table 37).

The most unfavorable location factor for Central Area offices was the traffic congestion whereas for the Non-Central offices the unfavorable ones were the poor public transportation, traffic congestion, obsolescence of the building and



TABLE 37 - OIL OPERATIONS OFFICES, EDMONTON: FAVORABLE  
FACTORS OF INTERVIEWED OFFICES' INTRA-CITY LOCATION

Favorable Location Factors	Frequency of Response	
	Central Area Offices	Non-Central Area Offices
Location facilitates functional linkages with:		
- administrative oil offices	2	-
- oil operations offices	2	32
Close to other establishments of your company	-	5
Face-to-face contacts	-	12
Prestige location	2	-
Adequate floor space and room for expansion	4	25
Low rents, suitable lease arrangement	-	23
New or suitable building	4	10
Good public transportation	2	-
Close to shopping facilities for employees	2	-
Adequate parking	-	26
Little traffic congestion	-	16
Close to airport	-	4
Access to railway trackage	-	2
Good access to radial, arterial roads	-	14
Central location within Central Area	4	-
Maximum response possible for each factor	4	33

Source: Personal interviews, 1970.



inadequate room for expansion at the site (Table 38). Almost all of these unfavorable factors for the Non-Central Area were cited by offices located in South Edmonton along or near 104 Street where traffic congestion is a problem, many of the buildings are old and sites are small.

TABLE 38 - OIL OPERATIONS OFFICES, EDMONTON: UNFAVORABLE FACTORS OF INTERVIEWED OFFICES' INTRA-CITY LOCATION

Unfavorable Location Factors	Frequency of Response	
	Central Area Offices	Non-Central Area Offices
Location too far from other operations offices	-	1
Location has low or declining prestige	1	-
Inadequate floor space	-	3
Obsolescence of buildings, site too small	-	5
High rents	-	1
Poor public transportation	-	9
Too far from personal services for employees	-	2
Inadequate parking	1	-
Traffic congestion	2	7
Maximum response possible for each factor	4	33

Source: Personal interviews, 1970.

Primary Location Factors. Taking into account the favorable location factors cited by interviewees (Table 37) and the weighted responses (Table 39), the most important



TABLE 39 - OIL OPERATIONS OFFICES, EDMONTON:  
INTRA-CITY LOCATION FACTORS

Location Factors	Combined Weighted Responses <sup>1</sup>	
	Central Area Offices	Non-Central Area Offices
Need for contact with oil operations offices	3	37
Proximity to Producers, Explorers and Developers	5	2
Availability of land or space in good industrial area	3	64
Good access to arterial and radial roads	-	28
Low cost of rent or land	-	6
Access to railway trackage	2	4
Proximity to other establishments of the firm	-	5
Adequate parking	-	4
Lack of few competitors	-	2
Personal	-	19
Accessibility (Central Area)	8	-
Central but outside the Central Area	-	7
Number of interviewees	4	33

<sup>1</sup> Each interviewee was asked to state in order of importance the two or three most important factors considered by the firm in its intra-city location. The first mentioned factor was given a weight of three, the second two, and the third one. The weights for each factor were totalled according to the number of responses to obtain the combined weighted responses.

Source: Personal interviews, 1970.

location factors for the Central Area offices were the accessibility of the Central Area for employees and business clients



and the availability of good office space. The availability of office space in the Central Area was discussed in relation to the location of administrative oil offices in Central Edmonton. The accessibility of the Central Area for business clients as a location factor was mentioned particularly by the Lease Brokers and Land Agents, who found the downtown location most central for out-of-town clients. Also they were close to the Provincial Government offices. One Central Area firm interviewed was located in the light industrial area which parallels the railway tracks and chose the site because of the cheap space available and the access to trackage.

The most important reason mentioned by Non-Central interviewees for their intra-city location was the availability of land or space in a good industrial area (Table 39). This factor was significant for those offices located in the newer industrial area south of 63 Avenue, the Marathon Industrial Park and in Northwest Edmonton. Some of the firms interviewed had recently moved from the congested 104 Street area to these new areas to obtain better quality space, larger sites for expansion, better truck docking facilities and to gain better access to main thoroughfares.

Good access to main thoroughfares, the third significant location factor, was of increasing concern to oil operations offices in deciding on a location. There was good access to main highways leading south, west, and east from



Argyll Road, 63 Avenue and the Marathon Industrial Park. The good access to highways leading to oil and gas fields north and west from Edmonton influenced some firms to locate in the northwest part of the city; an additional attraction was the access to the Industrial Airport for the shipment of materials and equipment North by plane.

The second important reason for Non-Central Area offices locating where they were was the need for contact with other oil operations offices. This factor was most applicable for those firms located in the South Edmonton oil operations district for it was there that the major supply houses are located. It was discovered through the interviewing that the oil operations offices depend upon one another for various services and supplies and that the location of one office will influence the location of others because of these linkages. Almost all of the Oilwell Servicing offices are found in South Edmonton in proximity to the major supply stores. The ties with heavy equipment firms located in West and Northwest Edmonton influenced some Oilfield Construction firms to locate in that part of the city.

Personal reasons, of fourth rank, included the owners desire to locate in that part of the city nearest to his home or close to where the majority of the employees lived.

It is of interest to add that the lack of concentrated competition (other firms of the same type) was a factor in the location of some oil operations offices in Northwest Edmonton.



Location Factors, Summary. A major reason for the lack of oil operations offices in Central Edmonton is the fact that few Producers, Explorers and Developers are located in the Area. Therefore, there is little desire by most operations offices to locate where cost of space is high and traffic congestion and parking are problems. It has already been emphasized that there are few Producers, Explorers and Developers in the entire city. The major factors accounting for the location of oil operations offices in the Central Area were its accessibility for employees and business clients and the availability of good office space. One-half of the Central Area interviewees, however, felt that their office location was satisfactory but not necessary.

The high degree of clustering of oil operations offices in the South Edmonton oil operations district is related to the availability of space, the need for contacts amongst the offices and the access to good arterial and radial roads which connect with major highways. Traffic congestion, obsolescence of building, and inadequacy of the site were mentioned by firms located along 104 Street South as unfavorable factors. Firms located elsewhere in South Edmonton felt that the poor public transportation for employees was the main unfavorable factor. Personal reasons also were of some importance as a location factor.

#### SUMMARY

In this chapter, the development and location of oil



offices for Central and Non-Central Calgary and Edmonton from 1950 to 1970 were examined and the location factors were analyzed.

If the two cities are compared the most striking difference is the high concentration and high degree of clustering of administrative and operations oil offices in Central Calgary, and the comparative absence of administrative and operations oil offices from Edmonton's Central Area throughout the study period.

The prime factors accounting for the large number (803 in 1969-70) and high degree of clustering of administrative oil offices in Central Calgary were the need for contacts especially with and amongst Producers, Explorers and Developers, and the desire for these contacts on a face-to-face basis. All of the Central Calgary administrative office interviewees were of the opinion that their office location was highly desirable or absolutely necessary. The relative absence of administrative oil offices from Edmonton's Central Area is due primarily to the fact that there were few offices of this group in Edmonton (158 in 1969-70 and of these 72 were in the Central Area) and the functional ties amongst the offices were not strong. Indeed 67 per cent of the Central Edmonton interviewees thought that their location was satisfactory but not necessary which suggests that they could just as well be located outside the Central Area. The main reasons for a Central Edmonton location related to the availability of office space and to the accessibility of the area.



Concerning administrative oil offices in a Non-Central location the proportion was very low for Calgary throughout the study period (16 per cent or less) but for Edmonton it increased from 15 to 54 per cent. The main factors influencing the location of administrative oil offices in Non-Central Edmonton were the low rent and availability of suitable office space, the good parking, and the lack of traffic congestion. The offices in North Edmonton along or near 124 Street and near the airport cited the access to the airport as a factor of some importance in their location. Nearly two-thirds of the interviewed administrative offices in Non-Central Edmonton were of the opinion that their location was highly desirable.

The prime reasons for the concentration of oil operations offices in Central Calgary were the same as those for the administrative offices. Although offices of this group increased in number in Central Calgary, they declined as a per cent of the city total from 83 per cent in 1950-51 to 54 per cent in 1969-70. The comparatively few oil operations offices in Central Edmonton were located there primarily because of the accessibility and the availability of good office space. Of the interviewed offices of this group in the Central Areas of the two cities, 86 per cent of those in Calgary felt that their location was highly desirable or absolutely necessary while 50 per cent in Edmonton thought that their location was satisfactory but not necessary. The



offices in Calgary felt much more strongly than those in Edmonton, the need to be in the Central Area.

If the oil operations offices in the Non-Central Areas of Calgary and Edmonton are compared, in each city a major oil operations district has developed along and in proximity to a major artery which connects with the main highway leading to the first major oil field discovered in the city's region, namely Turner Valley for Calgary and Leduc for Edmonton. However, in Edmonton a secondary oil operations district has developed in the Northwest part of the city. A major difference between the two cities is that for 1969-70 Non-Central Edmonton had 88 per cent of the total city operations offices while Non-Central Calgary had only 46 per cent. Nevertheless in both cities the Non-Central Areas were increasing their share of the city total of operations offices. The important location factors for the Non-Central offices in both cities were essentially the same, namely, the availability of land in a good industrial area and room for expansion, the comparatively low cost of land or rent, the functional linkages with other oil operations offices and the good access to arterial and radial streets and roads. The functional linkages were somewhat more important for Edmonton than Calgary operations offices. In both cities about one-half of the interviewees were of the opinion that the location of their office was satisfactory but not necessary. In other words it was felt that other Non-Central sites with



general proximity to other oil operations offices could be just as suitable as long as the basic important location requirements could be satisfied.



## CHAPTER VII

### CONCLUSIONS

This study has focused upon the inter- and intra-city patterns of oil office development and location for Calgary and Edmonton from 1950 to 1970 and has analyzed the factors responsible for these patterns. Two major groups of oil offices, administrative and operations, consisting of twelve specific types, were studied and analyzed in order to gain an understanding of the impact of the oil industry upon Calgary and Edmonton's development as oil office centres.

In this chapter conclusions are presented as follows: first as they apply to the inter-city location of oil offices; second, as they apply to the intra-city location of oil offices; and third as they relate to the dispersed city hypothesis, the decision making process, and to the use of some geostatistical aids for analyzing the location patterns of oil offices.

#### INTER-CITY OIL OFFICE LOCATION

It was the discovery of oil at Leduc in 1947 and the many major and minor additional discoveries in the years to follow which dramatically transformed Calgary and Edmonton into Canada's two leading oil office centres. In 1969-70 the



two cities contained most of the administrative and operations oil offices in Canada and also were the leading head office centres for various types of oil firms. Throughout the twenty-year study period Calgary in particular has been outstanding as a head office centre for both the administrative and operations groups of oil offices of which in 1969-70 it had 64 and 36 per cent of the Canadian total respectively. On the other hand Edmonton for the same data year had 9 per cent of the Canadian total of head administrative oil offices and 23 per cent of the head operations offices.

The underlying reason for the development of the two cities as oil office centres was the disposition of the natural resource oil because both are situated in the heart of Canada's oil producing region. Related oil offices located in these two major centres to perform various primary functions connected with the oil industry. In this regard, Weber points out that the larger and more prolific an oil region, the greater the number of oil businesses that will congregate there, and these will congregate at major collection and distribution points for the region.<sup>1</sup>

Although Calgary is recognized as the oil administrative centre and Edmonton the oil operations centre, the study

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<sup>1</sup>D. Weber, A Comparison of Two Oil City Business Centers (Odessa-Midland, Texas), Chicago, Department of Geography Research Paper No. 60, University of Chicago, 1958, p. 152.



has revealed that they are not distinct specialized halves of an oil industry complex. Rather, Calgary, in addition to being outstanding in the number of administrative oil offices, had more oil operations offices than Edmonton throughout the study period. However, there is a basic difference in the oil operations functions performed by the two cities in that Calgary's emphasis is service-sales whereas Edmonton's is service-manufacturing. A large number of oil operations sales offices are concentrated in Calgary while Edmonton has the major supply houses, stores, machine shops and manufacturers of oilfield equipment. The nature of the differences which exist between the two cities in their oil operations functions, however, is a topic open for more detailed study. Also in future studies, size of all administrative and operations oil offices in terms of criteria such as floor area should be taken into consideration.

On the basis of evidence gathered by the interview survey of 112 oil offices, the most important factor accounting for the location of the large number of administrative and operations oil offices in Calgary was the desire to be near Producers, Explorers and Developers for contacts. Amongst administrative offices in Calgary and in particular the Producers, Explorers and Developers type, there are a variety of functional linkages, for example, unitization and joint venture meetings, which necessitate that firms get together. Therefore, a location in the same city has great



benefits in terms of time, convenience and accessibility. Likewise the evidence shows that it is of great benefit for some operations offices to be near Producers, Explorers and Developers for sales and business. Indeed, more than 95 per cent of the administrative and operations oil office interviewees were of the opinion that their office location was highly desirable or absolutely necessary. Thus in essence, the key factor responsible for the location and concentration of oil offices in Calgary is the ties amongst the Producers, Explorers and Developers.

The most important factor accounting for the location of the comparatively few administrative and the many operations oil offices in Edmonton was the desire to be near the major oil fields, the majority of which are in the Edmonton region and in the areas to the North. Good access to the North was also a factor of some importance in an Edmonton location. It was significant to note that some of the Edmonton administrative offices could just as well be located in Calgary as revealed by interviewees' statements to that effect and by the fact that 63 per cent felt that their location within the city was satisfactory but not necessary.

For administrative and operations oil offices in both cities the second most important location factor was the personal-historical one which was relevant particularly to small firms. With the oil discoveries, many individuals started oil firms within the respective cities or within the



city regions and in some cases the oil business was an out-growth from a non-oil business. The early oil activity in Turner Valley and in Southern Alberta certainly was of significance in the location of oil offices in Calgary. The results of the study clearly reveal the importance of personal-historical factors in the location of oil offices.

The most significant trends in the inter-city location of administrative oil offices throughout the study period was the shift of Producers, Explorers and Developers offices as well as personnel involved with administrative and technical decision making from Edmonton to Calgary. This trend is expected to continue because some of the Producers, Explorers and Developers interviewed stated that they could just as well be located in Calgary. However, personal reasons and the fact that air connections between the two cities in terms of the airbus are good will cause some to remain in Edmonton. Also for those firms which have producing wells in the Edmonton region it is still of some advantage to have an office in Edmonton close to the oil fields. Lease Brokers and Land Agents also are moving from Edmonton to Calgary in order to have close contacts with Producers, Explorers and Developers.

The most marked trend related to oil operations offices was the move of Edmonton sales offices and personnel to Calgary also because of the need for close contacts with Producers, Explorers and Developers. The move of sales



offices and personnel, however, does not constitute a threat to Edmonton's role as an oil operations centre. The inertia of invested capital precludes this possibility. Moreover, with the emphasis on Northern oil exploration, an Edmonton location has advantages particularly for the movement of heavy equipment and supplies to the North by land, water and air. Edmonton is increasing in importance as a refining centre<sup>2</sup> and has a very important petro-chemical industry. Edmonton should also benefit considerably from major oil discoveries in the North both as a supply base and a terminal for oil and gas pipelines. Also Edmonton is closer than Calgary to the vast tar sands which are just beginning to be developed.

Calgary should continue to thrive as the administrative oil centre. Increasingly oil industry decision making is being concentrated in the city not only from Edmonton but also from other Canadian centres. With oil activity spreading out and becoming national in scope, Calgary is the base for the directing of activities. Improved air transportation is a very important factor in this development. Indeed, one major Producer, Explorer and Developer aptly pointed out that today it is just as easy to direct exploration activity in Eastern Canada from Calgary as from Toronto and a location in Calgary has the added advantage of being close to other

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<sup>2</sup>Refining is gradually being phased out in Calgary by those firms which have refineries.



oil companies and related decision makers.

The immediate future for Calgary and Edmonton as oil office centres appears good. The Oil and Gas Conservation Board in 1968 estimated that proven remaining reserves of crude oil and natural gas are adequate to serve Canadian and American markets for over thirty years<sup>3</sup> at the current rates of consumption. Furthermore, the McMurray tar sands in Northern Alberta with their vast oil potential are just beginning to be tapped for oil. Both Calgary and Edmonton as the experienced oil centres in Canada will undoubtedly benefit from oil and gas discoveries in Northern Canada.

Calgary's development as the oil administrative centre rather than Edmonton is primarily due to its early start and experience with the oil industry because of Turner Valley and the exploration activity in Southern Alberta. When the really important discoveries were made in the Edmonton region, an experienced administrative organization was already firmly established in Calgary and the forces of inertia assured its continued development. However, other factors which also contributed to this development were: its nearness to the United States and the American influence, the relatively good rail and air access to American oil centres, the attractions of the Calgary region and the city's initiative in providing the required office space. Were it

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<sup>3</sup>Alberta Government, Bureau of Statistics, Department of Tourism. Alberta Industry and Resources, 1970 Edition. Edmonton, Queen's Printer, 1970, p. 66.



not for Calgary's early start, Edmonton likely would have developed as the oil administrative centre as well as have been much more important in its oil operations function. The most drastic change in Edmonton's form besides its increased size would have occurred in its downtown.

#### INTRA-CITY OIL OFFICE LOCATION

The analysis of the intra-city location of oil offices for the study period revealed that the main reason for the highly built-up, skyscraper-dominated Calgary downtown and the much less built-up Edmonton downtown with little outward evidence of oil offices was the large number and per cent of the city total of administrative and operations offices clustered in downtown Calgary and the comparatively few offices of both groups in Edmonton's central business district.

The major factors which influenced oil offices to concentrate in Central Calgary were the need for many contacts and these on a face-to-face basis. The key oil offices responsible for this great clustering are the Producers, Explorers and Developers who themselves considered the central location highly desirable or absolutely necessary because of the many interrelationships and who depend upon other administrative oil offices for required services. Oil operations offices, many of which are sales offices, desired close contacts with Producers, Explorers and Developers for



business. The desire by all these oil offices to be close together created a great need for good office space. The availability of good office space was the second most important factor in the location of oil offices in Central Calgary. The demand for office space in Calgary's downtown also resulted from the very rapid growth of some of the offices especially those of the Producers, Explorers and Developers type.<sup>4</sup> Office construction in downtown Calgary largely for oil firms is still very active and is expected to continue for some time in light of the fact that major Producers, Explorers and Developers are increasingly centralizing their administrative decision-making function in Central Calgary. The shift to Calgary of some Producers, Explorers and Developers offices and of decision-making personnel from Edmonton was noted; however, other Canadian centres have also lost administrative offices and personnel to downtown Calgary.

Edmonton, in comparison with Calgary had few oil administrative offices throughout the study period. For those in the city, most of which tended to be small, the trend was a movement from the high-rent and congested Central Area to North Edmonton where they were able to find suitable office space with good parking and with good access to the airport. For those administrative oil offices in Central Edmonton, the evidence gathered indicated a lack of strong linkages amongst the

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<sup>4</sup>For example, one medium-sized oil firm increased its office staff in Calgary from three to over three hundred persons since 1947.



offices. Rather, their location was influenced largely by the accessibility of the Central Area and the availability of good office space.

Concerning oil operations offices, the research revealed that throughout the study period the majority of the city total in Calgary were located in Central Calgary. On the other hand, most of the oil operations offices in Edmonton were in the Non-Central Area. In the Non-Central Areas of both cities a major oil operations district developed along or near a major artery connecting with a main highway. Transport route accessibility was becoming of increasing importance as a location factor. Other important location factors included the availability of low-cost space in a good industrial area and the need for functional linkages (stressed by Edmonton oil operations offices). The significant trend for Edmonton oil operations offices and one that undoubtedly will continue was a shift away from congested 104 Street to new and larger sites in the same general vicinity or to the Northwest part of the city. In Calgary, a continued move of some operations offices including sales offices from the Central Area to the oil operations district is expected as firms expand and consolidate establishments under one roof on new larger sites where space is considerably less expensive than in the Central Area. Some of the interviewed offices which had moved expressed the view that the added business gained by having a Central Area location would not



compensate for the high cost of the space required for expanded and improved facilities.

## THE DISPERSED CITY HYPOTHESIS, THE DECISION-MAKING PROCESS, AND GEOSTATISTICAL AIDS

### The Dispersed City Hypothesis

The fact that Calgary and Edmonton are two major centres, of comparable size, separated by tracts of non-urban land, and are larger than would normally be expected for the services which they provide for their surrounding agricultural regions, fulfils one of the prerequisites of the dispersed city hypothesis. Moreover, each city performs a different function for the oil industry, Calgary administrative and Edmonton operations with particular emphasis upon service-manufacturing, goods handling, and transport and heavy oil-field equipment. The two cities complement one another. Moreover, as noted earlier in the study, Calgary is increasing in importance as an administrative centre whereas Edmonton is increasing in its specialized oil operations function particularly transportation and oilfield construction and refining. However, the fact that Calgary duplicates Edmonton somewhat in oil operations, is a variance from the requisites of the dispersed city hypothesis, although it must be recognized that Calgary's oil operations emphasis is service-sales. Moreover, the data on head office-branch office relationships, the movement of persons, goods, and communications related to the oil industry, strongly indicate



a high degree of interaction and interdependence. Therefore, Calgary and Edmonton's functions as oil office centres may be viewed as taking place in a single dispersed city rather than in two separate places. The high degree of spatial interaction indicated by the data available was made possible by the well developed transport and communications systems so that the 180 miles separating the two centres is not too great for this interaction.

The information obtained about Calgary and Edmonton in the course of the research strongly suggests that there is considerable merit in applying the dispersed city hypothesis to the functional specialization of Calgary and Edmonton as oil centres. However, the topic needs to be researched in much greater detail than has been possible in the course of this investigation and could well be a thesis in itself.

#### The Decision Making Process

The information obtained about the decision making process although brief was of value in interpreting the results of the location factors for oil offices. Also, the data revealed that the process itself is a factor of importance in influencing oil office location. Therefore it should be taken into consideration in future research on the location of economic activities. The present inter- and intra-city oil office location patterns largely reflect decisions that were made by individuals and the increasing



emphasis on a committee method of decision making could have a bearing upon future location patterns. The results reported about the decision-making process must be viewed as being tentative. Much more research is required.

### Geostatistical Aids

The main purpose of the use of the geostatistical parameters such as mean centre, standard deviations and standard distance was to permit a summary of the distribution patterns of a large number of oil offices by means of a simple symbol in order to facilitate comparison within and among office types and to assist in identifying changes in dispersion and trends in location.

Because these methods are best suited to nodal distributions it was found that they had best application in the analysis of oil office distributions in the Central Areas of the two cities. The use of the Standard Distance Parameter symbols used in association with the actual point distributions of the various oil office types did provide a quick clear summary of the patterns. The symbols representing the distributions of specific oil office types for the five data years, when plotted on individual maps, were particularly useful in identifying the changes in dispersion and the trends of the location of oil offices in Central Calgary. The Standard Distance Parameters in symbol form confirmed the information obtained through the interview survey about location



trends in Central Calgary.

Once the computer print-out maps were obtained and examined it was found that the Standard Distance Parameters were not too meaningful in analyzing the distribution patterns of oil offices in the Non-Central Areas because of the several clusters present particularly in Edmonton. What is required is a computer program which will effect the optimal division of a dichotomic or trichotomic distribution to permit the computation of a mean centre for each part.

It would seem that Standard Distance Parameters as developed to this point as aids in urban land use analysis have best application to smaller areal units such as a central business district or a small urban centre where there is less likelihood of having multcentred distributions of urban functions. Geostatistical methods as utilized in this study can be effective tools for urban research. However, there is need for them to be subjected to much more testing.



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<sup>1</sup>Provincial and regional totals do not include the city totals.

Source: Nickle's Canadian Oil Register.



APPENDIX B

OIL OFFICE LOCATION, CALGARY AND EDMONTON  
Interview Survey

- A. 1. Name of Company \_\_\_\_\_  
 2. Address \_\_\_\_\_  
 3. Name of interviewee \_\_\_\_\_; position with company \_\_\_\_\_  
 4. Number of persons employed by your company at this address (include affiliated and subsidiary companies) \_\_\_\_\_  
 5. Number of square feet of Office space at this location \_\_\_\_\_
- B. INTER-CITY LOCATION
1. In your opinion is the location of your office in this city: (check one)  
 a. Absolutely necessary \_\_\_\_\_ d. Undesirable \_\_\_\_\_  
 b. Highly desirable \_\_\_\_\_ e. Unacceptable \_\_\_\_\_  
 c. Satisfactory but not necessary \_\_\_\_\_
2. If you checked c, d, or e in above question: Could you just as well be located in: a. (Edmonton), (Calgary) Yes \_\_\_\_\_ No \_\_\_\_\_  
 b. Red Deer or other center Yes \_\_\_\_\_ No \_\_\_\_\_
3. In what year did you first locate in this city? \_\_\_\_\_
4. Who made the decision to locate your office in this city? \_\_\_\_\_  
 \_\_\_\_\_ Position with company \_\_\_\_\_
5. Below is a list of possible reasons as to why your office is located in present city. Please rate each of these reasons by checking the appropriate box in the table.

REASONS	VERY IMPORTANT	SOMEWHAT IMPORTANT	NOT IMPORTANT
Desire to be near other oil companies . . . . .	_____	_____	_____
More prestige than other cities . . . . .	_____	_____	_____
Desire to be close to other operations or field activities of your company . . . . .	_____	_____	_____
Good access to required services and supplies . . . . .	_____	_____	_____
Access to banks . . . . .	_____	_____	_____
Good transportation connections with other cities . . . . .	_____	_____	_____
Special concessions given by the city . . . . .	_____	_____	_____
Availability of suitable land . . . . .	_____	_____	_____
Historical reasons (eg. early interest in Turner Valley, began business in city) . . . . .	_____	_____	_____
Personal reasons (eg. ready access to amenities recreational facilities, relatives) . . . . .	_____	_____	_____
Ready access to Government offices . . . . .	_____	_____	_____
Other reasons (specify) _____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

6. Please state in order of importance the two or three most important factors taken into consideration in the decision to locate in this particular city?  
 1) \_\_\_\_\_  
 2) \_\_\_\_\_  
 3) \_\_\_\_\_
7. Was a locational study done to assess the advantages and disadvantages of locating in Edmonton, Calgary or elsewhere? Yes \_\_\_\_\_ No \_\_\_\_\_  
 Comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



C. INTRA-CITY LOCATION

1. In your opinion is your present location within the city: (check one)
  - a. Absolutely necessary \_\_\_\_\_ d) Undesirable \_\_\_\_\_
  - b. Highly desirable \_\_\_\_\_ e) Unacceptable \_\_\_\_\_
  - c. Satisfactory but not necessary \_\_\_\_\_
2. If you checked c, d, or e in above question: Assuming that a suitable site and office space was available would it be more desirable for your office to be located: Near the airport? Yes \_\_\_\_\_ No \_\_\_\_\_  
 Near a suburban shopping center? Yes \_\_\_\_\_ No \_\_\_\_\_
3. Where in the city would be the most ideal location: \_\_\_\_\_
4. Was proximity to the Petroleum Club given any consideration in your location decision? Yes \_\_\_\_\_ No \_\_\_\_\_
5. Please indicate which of the following you consider to be favorable and unfavorable factors of the present location of your office within the city:

FAVORABLE FACTORS	UNFAVORABLE FACTORS
Location offers functional linkages to other oil offices or businesses _____	Location too far from other oil offices or businesses _____
Close to other establishments of your company _____	Too far from other establishments of your company _____
Face-to-face contacts _____	Lack of face-to-face contacts _____
Prestige location _____	Location has low or declining prestige _____
Adequate floor space and room for expansion _____	Inadequate floor space _____
New or suitable building _____	Obsolescence of building, site too small _____
Low rent _____	High rent _____
Good public transportation _____	Poor public transportation _____
Close to shopping facilities for employees _____	Inadequate shopping facilities for employees _____
Adequate parking _____	Inadequate parking _____
Little traffic congestion _____	Traffic congestion _____
Others (specify) _____	Others (specify) _____
_____	_____
_____	_____

6. Who made the decision for your offices to locate at this location within the city? \_\_\_\_\_  
 \_\_\_\_\_ Position with company \_\_\_\_\_
7. Please list in order of importance the two or three most important factors taken into consideration in the decision to establish at this location within the city?
  - 1) \_\_\_\_\_
  - 2) \_\_\_\_\_
  - 3) \_\_\_\_\_
8. Was a locational study done to assess the advantages and disadvantages of locating at this location within the city? Yes \_\_\_\_\_ No \_\_\_\_\_  
 Comments \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



D. CHANGES IN INTER-CITY LOCATION. 1950 - 1970.

Please list the moves of any of your offices from Edmonton to Calgary or Calgary to Edmonton since 1950. Indicate the primary factor or factors in your decision to relocate. Also give the name, position in the company, and city of residence of the person or persons making the decision to relocate.

YEAR	FROM	TO	REASONS	PERSONS MAKING DECISION TO RELOCATE		
				Name	Position	City of Residence

E. CHANGES IN INTRA-CITY LOCATION. 1950 - 1970

Please list the moves of any of your offices within the city since 1950. Indicate the primary factor or factors in your decision to relocate. Also give the name, position in the company, and city of residence of the person or persons who made the decision to relocate. (Reasons to relocate might include factors as inadequate parking, traffic congestion, obsolescence of buildings, high rent, previous location had low or declining prestige value, new location offered better functional linkages to other offices and businesses or more face-to-face contacts, various personal reasons, as well as others).

YEAR	FROM	TO	REASONS	PERSONS MAKING DECISION TO RELOCATE		
				Name	Position	City of Residence







TABLE 2. OIL OPERATIONS OFFICES: INTERVIEWEE RATING OF INTER-CITY LOCATION FACTOR

		Frequency of Response																	
		Calgary								Edmonton									
		Very Important				Somewhat Important				Very Important				Somewhat Important					
		All Types				All Types				All Types				All Types					
		B	I	L	E	G	D	J	No. %	B	I	L	E	G	D	J	No. %		
		* B I L E G D J								B I L E G D J									
Desire to be near Producers, Explorers, Developers . . . . .		11	1	1	1	2	2	4	22 100	-	-	-	-	-	-	-	-		
Access to other operations offices . . . . .		-	-	-	-	-	-	-	-	4	1	1	-	-	-	-	-		
Desire to be near oil and gas fields or field activities . . . . .		-	-	1	-	1	-	2	4 18	3	-	-	-	-	-	-	-		
Access to banks (Oil and Gas Departments <sup>1</sup> ) . . . . .		-	-	-	-	-	-	-	-	4	18	-	-	-	-	-	-		
Ready access to government offices <sup>2</sup>		-	-	-	-	-	-	-	-	4	18	-	-	-	-	-	-		
Good air connections with other cities; 3 good access to the North <sup>4</sup>		-	-	-	-	-	-	-	-	12	55	8	1	-	1	-	10 30		
Prestige . . . . .		-	-	-	-	-	-	-	-	1	5	-	-	-	-	-	-		
Proximity to the United States . . . . .		1	-	-	-	-	-	-	1 5	2	9	-	-	-	-	-	-		
Lack of saturated competition . . . . .		-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-		
Labor . . . . .		-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-		
Personal-historical . . . . .		5	-	-	-	-	-	-	5 23	2	9	13	2	2	-	2	9 24		
Maximum response possible for each factor		11	1	1	1	2	2	4	22	11	1	1	1	2	2	4	22		
										21 2 3 4 - 5 2 37								21 2 3 4 - 5 2 37	



APPENDIX D

ATLAS OF OIL OFFICE LOCATION,  
CALGARY AND EDMONTON,  
1950-1970

(See accompanying atlas.)



## APPENDIX E

TABLE 1. STANDARD DISTANCE PARAMETERS, ADMINISTRATIVE  
OIL OFFICES, CENTRAL CALGARY

Type	Time Period	Number of Locations	Number of Offices	Mean Centre	Standard Distance (Units) <sup>1</sup>	Alpha in Degrees	Standard Deviations at Alpha (Units)	X	Y
Producers, Explorers, Developers	1950-51	57	243	185.6	308.8	5.4	0.3	5.2	1.8
	1954-55	79	425	182.6	308.6	7.4	1	7.0	2.3
	1959-60	93	313	180.9	309.5	7.7	-4	7.1	3.0
	1964-65	70	346	177.1	310.1	7.7	-12	7.1	2.9
	1969-70	93	488	176.3	310.7	7.1	-3	6.5	2.8
Consultants and Data Processors	1950-51	17	22	180.9	309.9	11.7	-7	11.3	3.2
	1954-55	27	33	180.3	307.8	10.0	-1	9.4	3.3
	1959-60	47	76	178.3	309.3	9.1	-1	8.5	3.3
	1964-65	51	112	176.7	309.9	7.9	-4	7.1	3.4
	1969-70	75	221	175.8	310.2	8.3	3	7.1	4.3
Financial and Investment	1950-51	27	37	185.4	308.7	4.8	3	4.6	1.3
	1954-55	29	36	183.8	308.6	5.0	-4	4.8	1.3
	1959-60	29	40	183.5	308.0	5.2	4	4.4	2.7
	1964-65	33	46	180.3	309.7	6.3	-8	6.0	2.1
	1969-70	31	45	180.2	310.1	6.5	-5	6.0	2.5
Lease Brokers and Land Agents	1950-51	6	8	177.0	307.5	11.3	8	11.2	1.6
	1954-55	24	24	178.3	309.0	6.6	-5	6.4	1.6
	1959-60	13	16	180.0	309.2	9.2	-6	8.3	3.9
	1964-65	15	29	177.2	310.3	5.3	-14	5.0	1.7
	1969-70	26	47	173.9	311.4	7.4	-3	4.7	5.7

<sup>1</sup>One unit equals 150 feet



APPENDIX E

TABLE 2. STANDARD DISTANCE PARAMETERS, ADMINISTRATIVE  
OIL OFFICES, CENTRAL EDMONTON

Type	Time Period	Number of Locations	Number of Offices	Mean Centre	Standard Distance (Units) <sup>1</sup>	Alpha in Degrees	x	y	Standard Deviations at Alpha (Units)
Producers, Explorers, Developers	1950-51	23	49	157.4	191.1	6.7	6.2	2.5	15
	1954-55	47	114	155.8	191.6	9.1	8.2	4.0	4
	1959-60	30	65	155.9	191.9	9.5	8.9	3.2	5
	1964-65	24	-39	155.7	190.1	8.3	7.7	3.0	21
	1969-70	18	27	155.0	189.1	8.6	8.3	2.2	20
Consultants and Data Processors	1950-51	8	8	152.7	196.3	16.6	14.2	8.6	8
	1954-55	6	7	152.4	192.3	12.8	12.4	3.3	9
	1959-60	10	11	159.4	196.1	12.0	10.6	5.6	23
	1964-65	14	15	147.2	195.0	18.5	15.0	10.8	3
	1969-70	12	15	153.9	196.7	15.1	13.2	7.3	23
Financial and Investment	1950-51	16	20	158.6	190.6	3.5	3.2	1.3	0.1
	1954-55	16	22	159.0	190.9	2.7	2.3	1.4	2
	1959-60	22	24	158.9	191.3	3.3	2.9	1.7	-17
	1964-65	19	25	157.3	190.2	6.6	6.3	2.0	21
	1969-70	21	27	158.4	190.2	5.0	4.6	2.0	10
Lease Brokers and Land Agents	1950-51	7	8	157.3	191.9	4.3	3.6	2.3	11
	1954-55	5	5	157.9	191.3	2.3	0.9	2.2	-29
	1959-60	6	9	158.6	193.6	6.9	2.2	6.5	39
	1964-65	5	5	154.0	189.6	8.3	8.2	1.0	43
	1969-70	3	3	158.2	194.0	9.3	1.9	9.1	-43

<sup>1</sup>One unit equals 150 feet



APPENDIX E TABLE 3. STANDARD DISTANCE PARAMETERS, OIL OPERATIONS OFFICES, CENTRAL CALGARY

Type	Time Period	Number of Locations	Number of Offices	Mean Centre	Standard Distance (Units) <sup>1</sup>	Alpha in Degrees	Standard Deviations at Alpha (Units)
Service and Supply	1950-51	63	116	181.4	308.6	11.9	11.2
	1954-55	76	137	176.7	309.1	14.0	12.1
	1959-60	99	195	179.4	308.8	12.4	10.9
	1964-65	105	219	176.8	309.1	12.2	10.5
	1969-70	94	246	176.9	309.8	10.2	8.6
Oilwell Drilling Contractors	1950-51	15	21	186.1	308.0	6.1	6.1
	1954-55	24	36	181.6	308.8	10.0	9.9
	1959-60	26	43	181.5	308.6	8.3	7.8
	1964-65	17	26	178.8	310.2	6.7	6.5
	1969-70	20	34	174.9	311.1	5.0	4.7
Engineers, Designers, Constructors, Fabricators	1950-51	0	0	-	-	-	-
	1954-55	0	0	-	-	-	-
	1959-60	12	13	180.9	309.5	10.5	9.7
	1964-65	25	30	175.9	308.5	12.5	10.5
	1969-70	30	39	178.0	309.4	12.7	10.9
Geophysical and Exploration Drilling Contractors	1950-51	32	47	181.0	312.0	14.4	11.8
	1954-55	35	66	178.4	310.0	14.8	13.3
	1959-60	34	50	176.7	310.2	15.3	13.0
	1964-65	20	31	174.4	311.0	10.7	9.1
	1969-70	27	41	174.8	310.6	9.2	5.9
Oilwell Servicing	1950-51	0	0	-	-	-	-
	1954-55	5	7	175.3	308.9	9.9	9.9
	1959-60	17	22	181.0	310.3	6.3	5.9
	1964-65	16	22	179.0	310.3	7.4	6.8
	1969-70	17	21	176.6	311.3	6.3	5.8
Pipeline Companies and Power Distributors	1950-51	4	5	187.1	313.7	5.7	11.5
	1954-55	8	10	184.6	310.7	6.6	3.1
	1959-60	19	30	184.0	310.0	6.7	5.9
	1964-65	26	52	179.2	310.2	8.2	7.6
	1969-70	27	57	179.4	309.7	7.0	6.3
Refiners, Processors, Marketers and Plant Operators	1950-51	6	8	187.6	308.4	3.9	3.7
	1954-55	5	6	181.6	309.2	6.6	6.5
	1959-60	14	16	180.5	307.8	7.7	7.1
	1964-65	19	29	178.5	309.5	8.4	8.0
	1969-70	25	43	176.3	309.9	8.0	7.3
Transportation and Oilfield Construction	1950-51	0	0	-	-	-	-
	1954-55	0	0	-	-	-	-
	1959-60	0	0	-	-	-	-
	1964-65	10	11	178.4	311.3	11.5	11.1
	1969-70	11	12	175.5	308.8	12.9	12.2

<sup>1</sup>One unit equals 150 feet



TABLE 4. STANDARD DISTANCE PARAMETERS, OIL OPERATIONS OFFICE,  
CENTRAL EDMONTON

Type	Time Period	Number of Locations	Number of Offices	Mean Centre	Standard Distance (Units) <sup>1</sup>	Alpha in Degrees	x	Standard Deviations at Alpha (Units)	y
Service and Supply	1950-51	32	40	152.7	197.8	-16	10.4	7.2	
	1954-55	47	54	150.7	198.4	-13	11.7	7.5	
	1959-60	49	58	148.2	196.3	-21	12.4	8.0	
	1964-65	48	56	148.0	198.0	-19	12.8	8.3	
	1969-70	42	53	146.4	199.6	-21	11.8	7.9	
Oilwell Drilling Contractors	1950-51	8	10	158.5	193.4	16	5.9	1.7	
	1954-55	12	16	153.4	192.1	-0.1	9.0	5.4	
	1959-60	4	4	156.4	191.1	17	3.7	1.7	
	1964-65	0	0	-	-	-	-	-	
	1969-70	0	0	-	-	-	-	-	
Engineers, Designers, Constructors, Fabricators	1950-51	0	0	-	-	-	-	-	
	1954-55	0	0	-	-	-	-	-	
	1959-60	8	9	149.1	201.9	5	13.3	6.9	
	1964-65	9	9	147.3	200.0	1	17.4	9.4	
	1969-70	11	11	149.4	197.6	31	12.3	9.9	
Geophysical and Exploration Drilling Contractors	1950-51	7	8	153.9	194.1	-16	7.6	11.8	
	1954-55	9	12	149.2	194.1	34	13.9	9.5	
	1959-60	7	8	156.0	191.1	27	8.4	3.0	
	1964-65	2	2	-	-	-	-	-	
	1969-70	0	0	-	-	-	-	-	
Oilwell Servicing	1950-51	0	0	-	-	-	-	-	
	1954-55	2	2	-	-	-	-	-	
	1959-60	8	8	153.6	192.1	-9	13.3	3.4	
	1964-65	4	5	156.8	190.8	29	7.1	1.5	
	1969-70	3	3	154.7	188.5	22	7.9	0.6	
Pipeline Companies and Power Distributors	1950-51	6	6	154.5	191.7	7	6.0	1.7	
	1954-55	6	6	155.3	191.6	5	6.9	1.8	
	1959-60	4	5	151.3	188.3	6	8.7	0.5	
	1964-65	4	8	144.0	187.0	-13	6.0	1.9	
	1969-70	4	6	153.1	189.6	38	7.1	2.6	
Refiners, Processors, Marketers and Plant Operators	1950-51	3	3	149.2	195.2	-39	12.7	3.6	
	1954-55	4	4	147.4	198.9	43	4.1	12.8	
	1959-60	6	6	145.9	198.5	-29	14.2	3.1	
	1964-65	2	2	-	-	-	-	-	
	1969-70	4	4	149.4	193.5	-40	13.4	5.9	
Transportation and Oilfield Construction	1950-51	0	0	-	-	-	-	-	
	1954-55	0	0	-	-	-	-	-	
	1959-60	0	0	-	-	-	-	-	
	1964-65	5	6	149.4	193.1	-13	7.1	3.5	
	1969-70	6	6	149.3	195.8	-25	10.0	7.7	

<sup>1</sup>One unit equals 150 feet



APPENDIX D

ATLAS OF OIL OFFICE LOCATION,  
CALGARY AND EDMONTON,  
1950-1970



ADMINISTRATIVE OIL OFFICES,  
CALGARY





# PRODUCERS, EXPLORERS, DEVELOPERS

1950-51

CALGARY  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 1



**PRODUCERS,  
EXPLORERS,  
DEVELOPERS**

1950-51

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

	STANDARD DISTANCE PARAMETER
--	--------------------------------

- Oil and Gas Conservation Board  
Petroleum Club  
Cargary Inn  
Palisier Hotel  
Court House, Land Titles Office  
Husky Tower  
City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER

**Figure 2**





# PRODUCERS, EXPLORERS, DEVELOPERS

1954-55

CALGARY  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 3



# PRODUCERS, EXPLORERS, DEVELOPERS

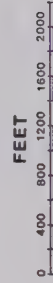
1954-55

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

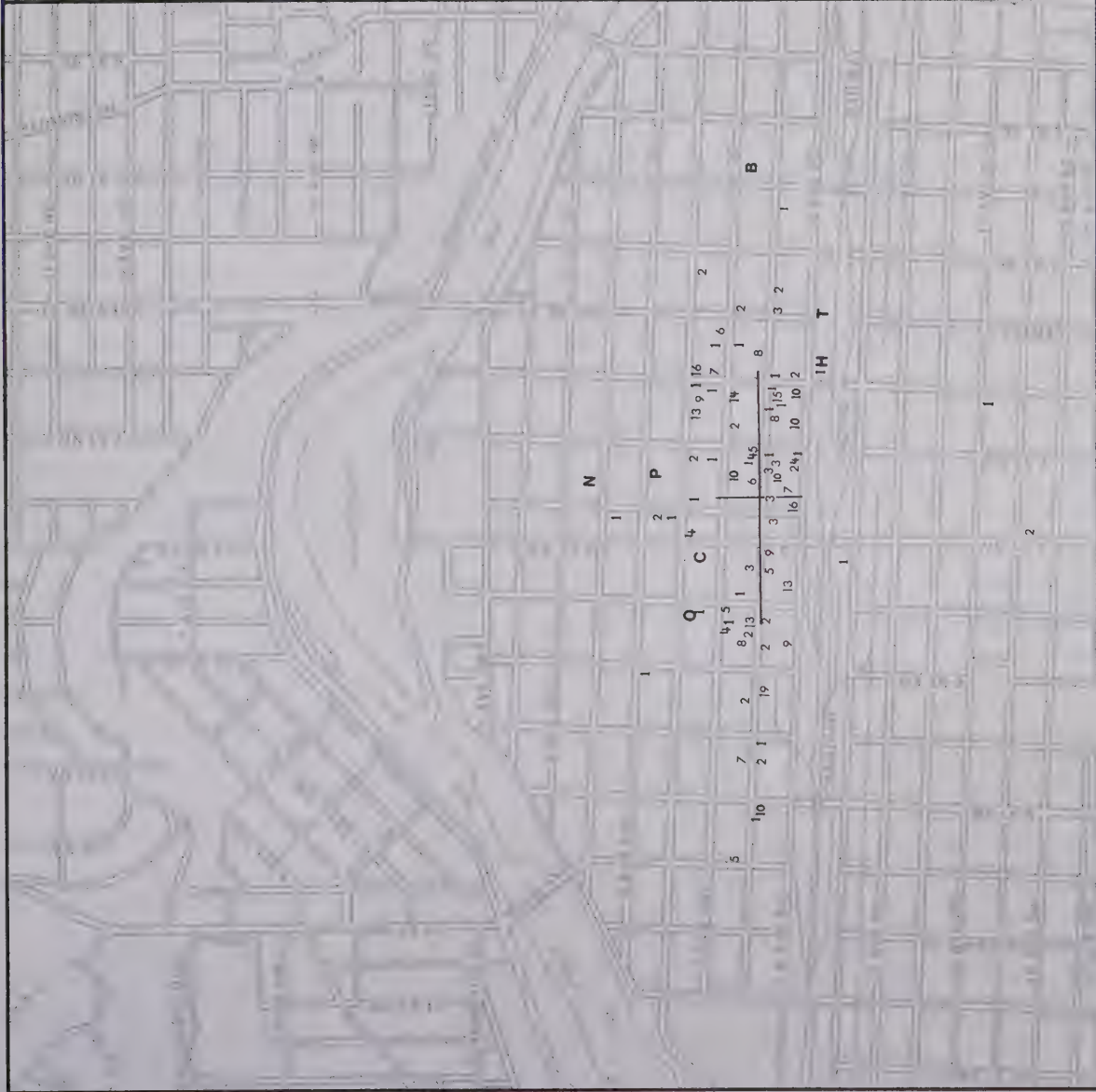
— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 4







# PRODUCERS, EXPLORERS, DEVELOPERS

1959-60

CALGARY  
CENTRAL AREA EXCLUDED

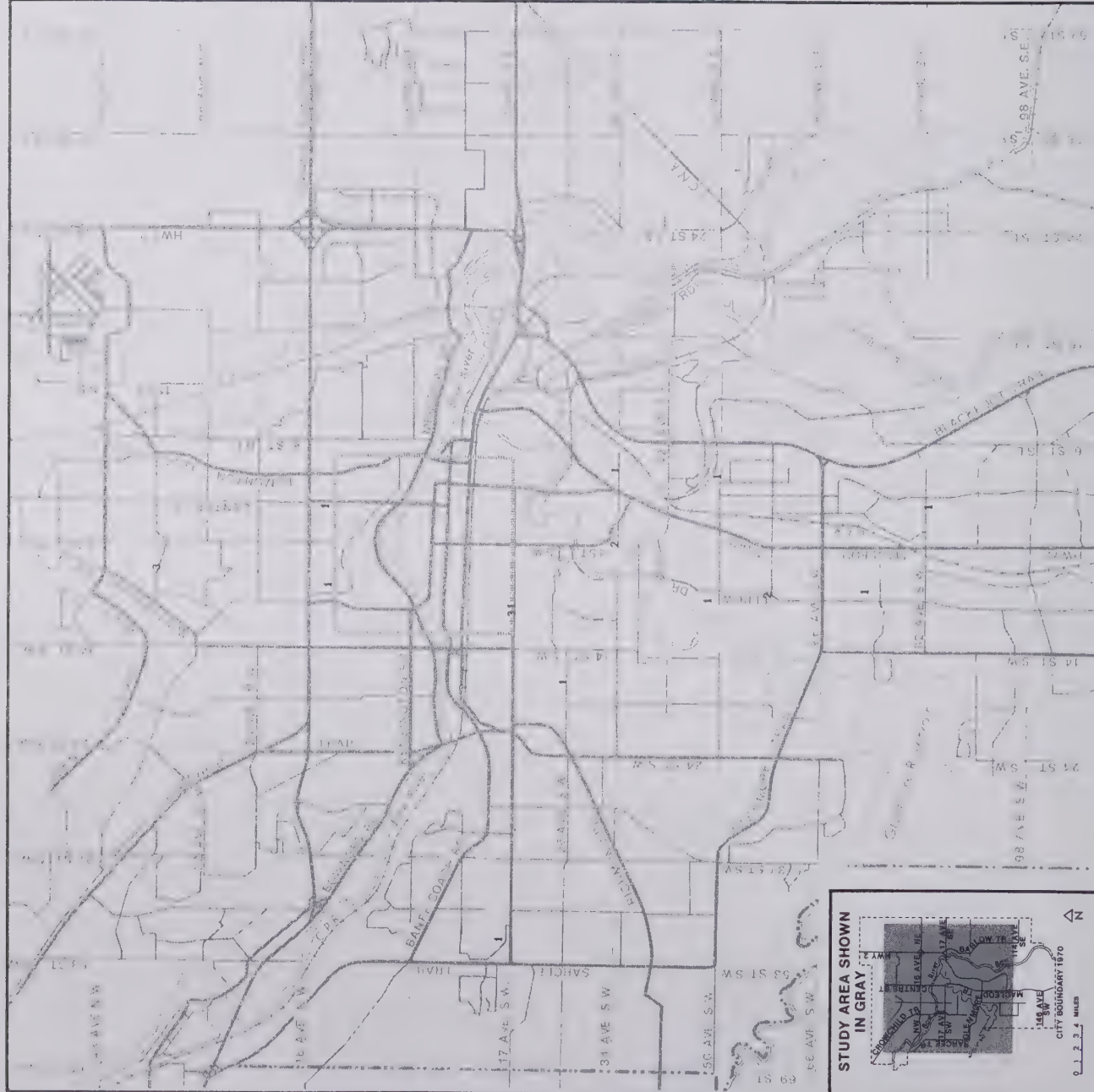
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 5



# PRODUCERS, EXPLORERS, DEVELOPERS

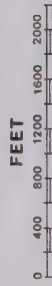
1959-60

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House
- T Land Titles Office
- B Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 6





# PRODUCERS, EXPLORERS, DEVELOPERS

1964-65

CALGARY  
CENTRAL AREA EXCLUDED

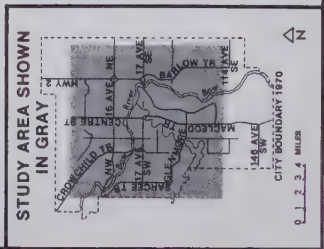
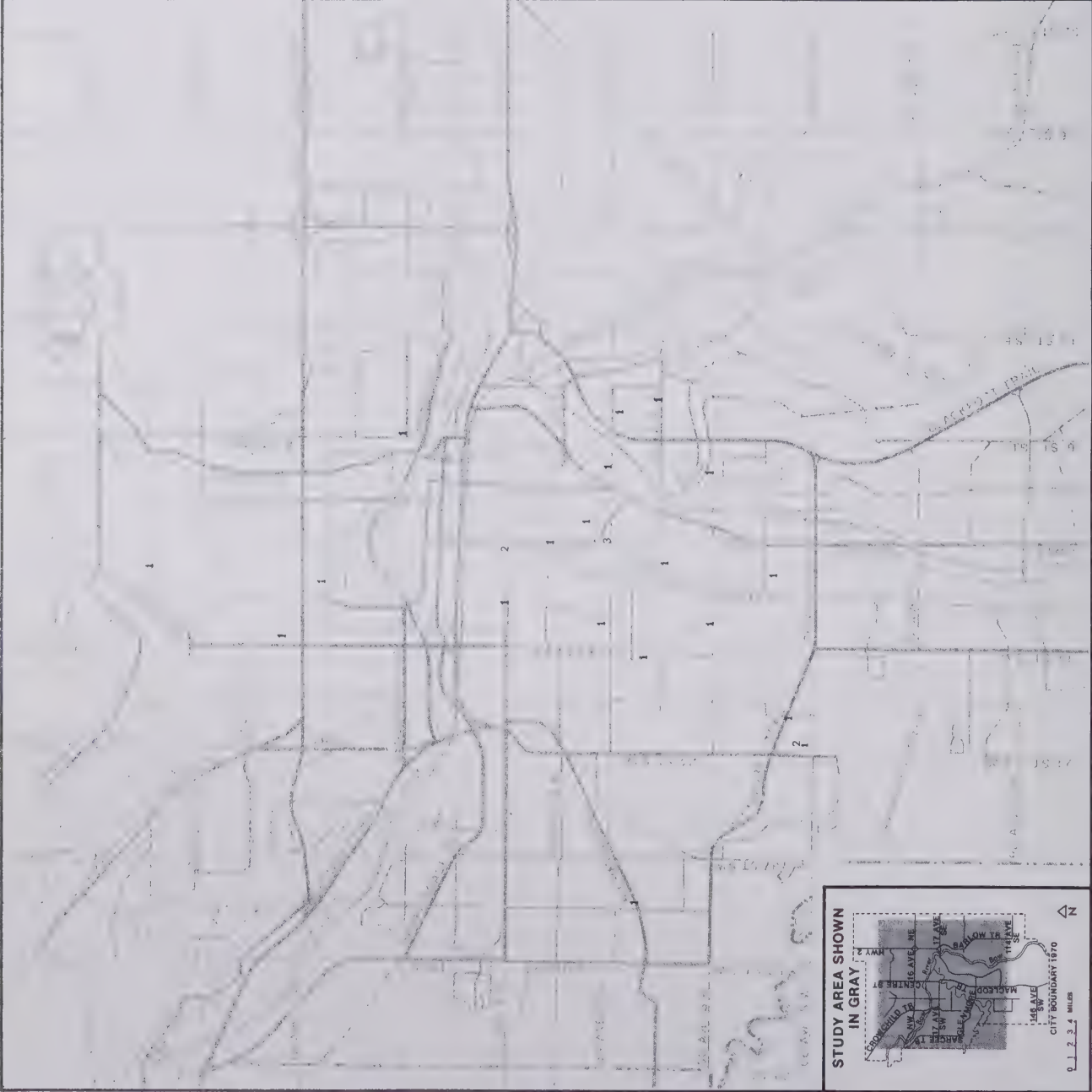
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 7



# PRODUCERS, EXPLORERS, DEVELOPERS

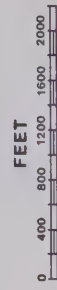
1964-65

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 8





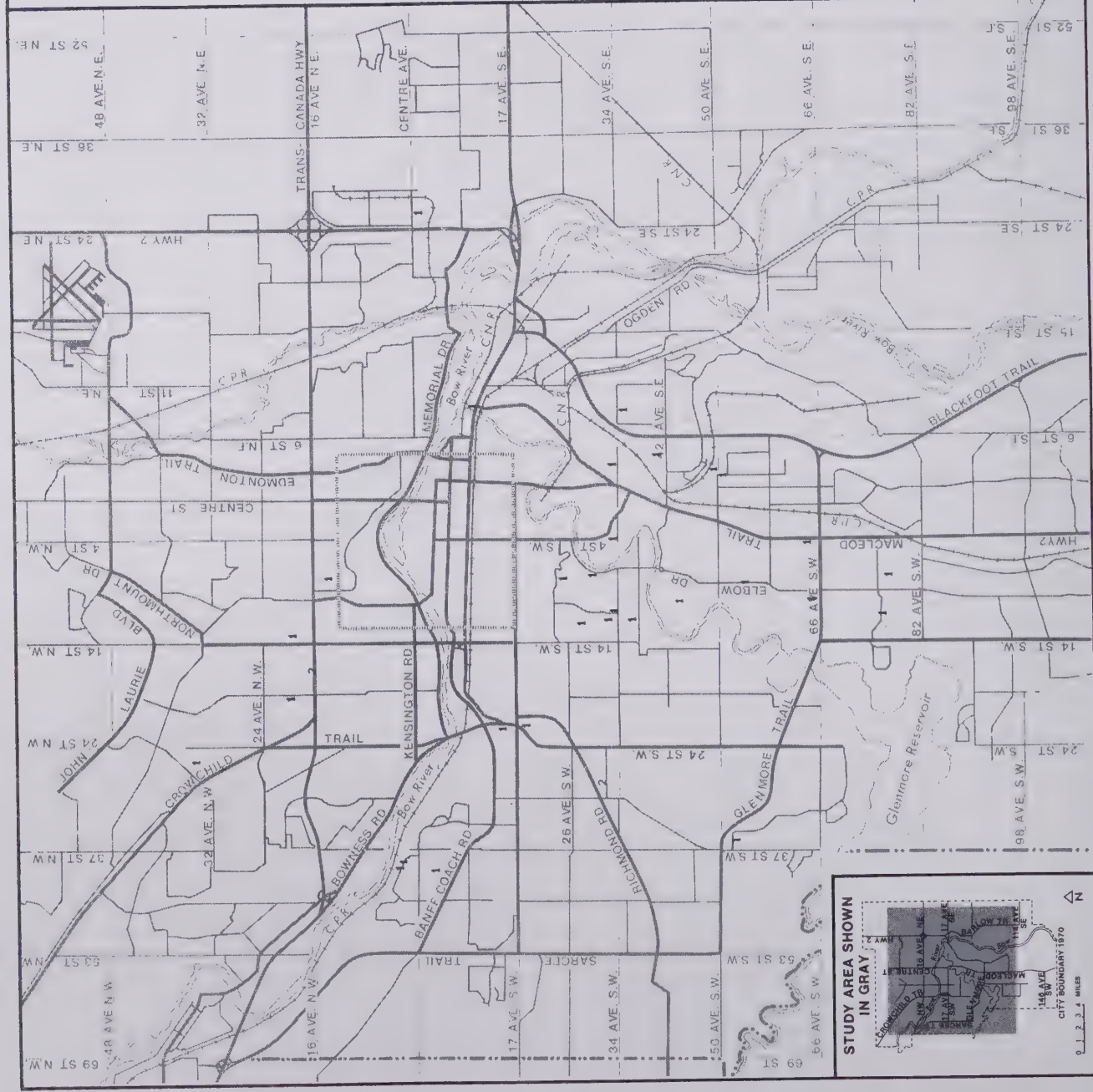


**CALGARY**  
**CENTRAL AREA EXCLUDED**

CENTRAL AREA

A vertical number line with major tick marks at 0, 2000, 4000, 6000, 8000, 10000, and 12000. Minor tick marks are present at every 1000 units.

**Figure 9**



# PRODUCERS, EXPLORERS, DEVELOPERS

1969-70

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

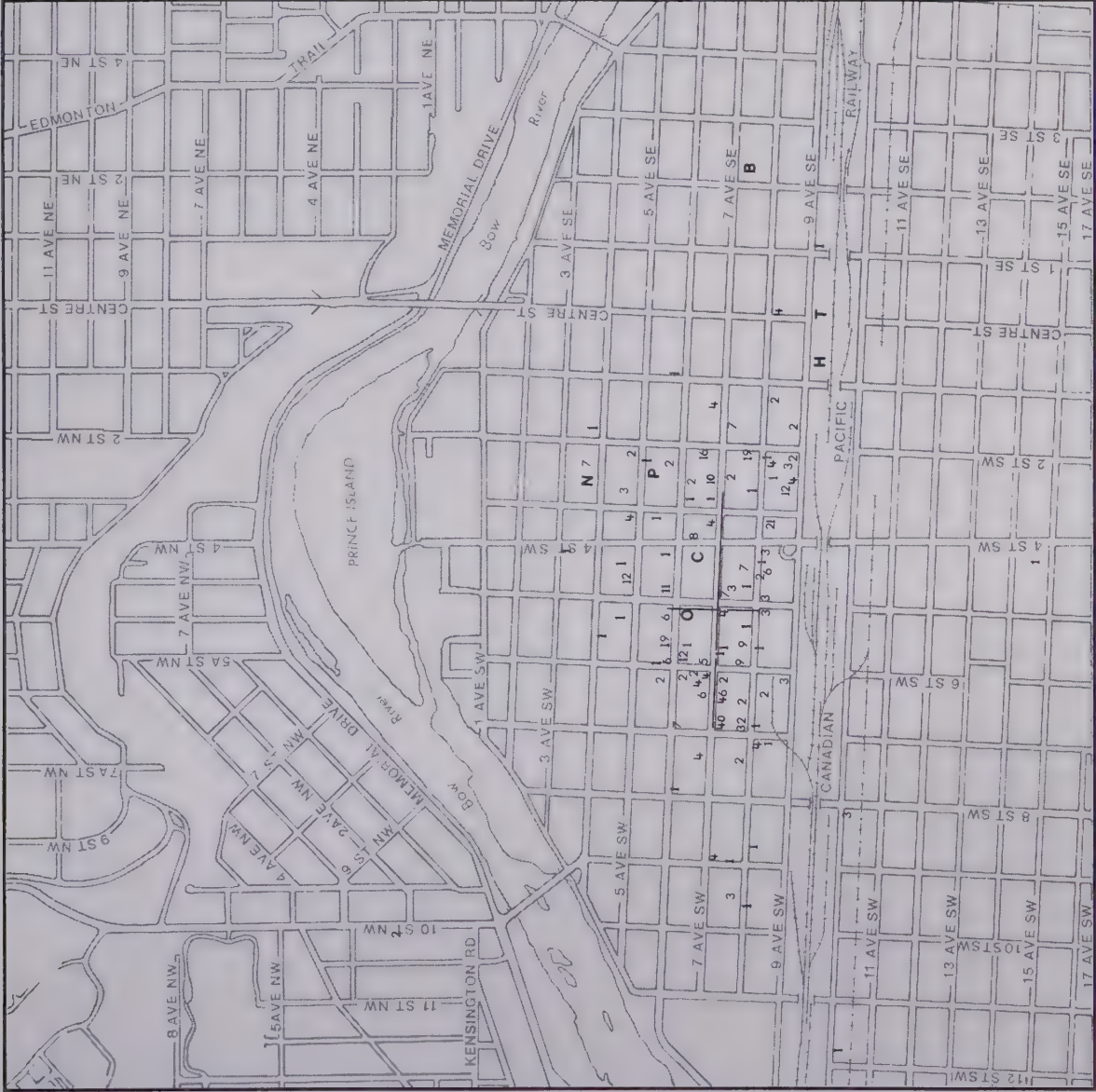
— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 10



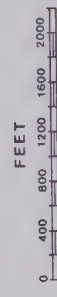


# PRODUCERS, EXPLORERS, DEVELOPERS

## CENTRAL CALGARY

### STANDARD DISTANCE PARAMETER

- 1 1950-51
- 2 1954-55
- 3 1959-60
- 4 1964-65
- 5 1969-70



G. H. Z.

Figure 11







**CONSULTANTS-  
GEOLOGICAL, GEOPHYSICAL,  
ENGINEERING,  
LAND, SURVEYING**

**DATA PROCESSORS  
1950-51**

**CALGARY  
CENTRAL AREA EXCLUDED**

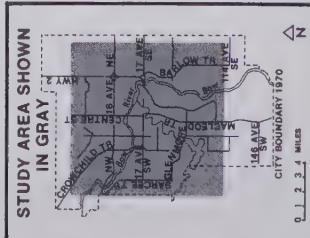
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 12



**CONSULTANTS-  
GEOLOGICAL, GEOPHYSICAL,  
ENGINEERING,  
LAND, SURVEYING**

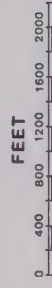
**DATA PROCESSORS  
1950-51**

**CENTRAL CALGARY**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

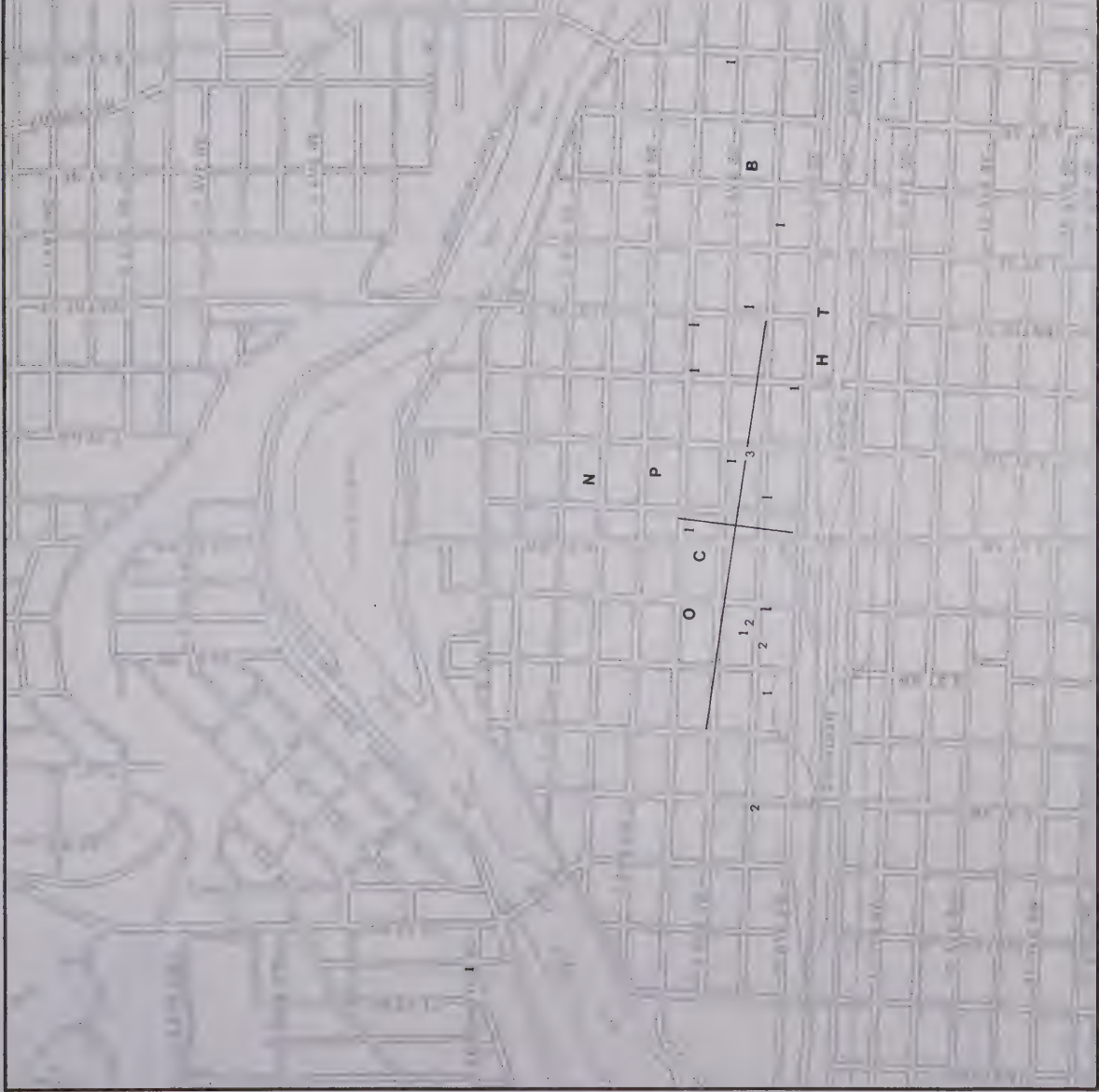
—+— STANDARD DISTANCE  
PARAMETER

- |   |                                       |
|---|---------------------------------------|
| O | Oil and Gas Conservation Board        |
| P | Petroleum Club                        |
| N | Calgary Inn                           |
| H | Palliser Hotel                        |
| C | Court House, Land Titles Office       |
| T | Husky Tower                           |
| B | City Hall and Administration Building |



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 13







# CONSULTANTS- GEOLOGICAL, GEOPHYSICAL, ENGINEERING, LAND, SURVEYING DATA PROCESSORS

1954-55

CALGARY  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

— CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 14



# CONSULTANTS- GEOLOGICAL, GEOPHYSICAL, ENGINEERING, LAND, SURVEYING

## DATA PROCESSORS

1954-55

### CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 15





# CONSULTANTS- GEOLOGICAL, GEOPHYSICAL, ENGINEERING, LAND, SURVEYING DATA PROCESSORS 1959-60

CALGARY  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 16



# CONSULTANTS- GEOLOGICAL, GEOPHYSICAL, ENGINEERING, LAND, SURVEYING

## DATA PROCESSORS 1959-60

### CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

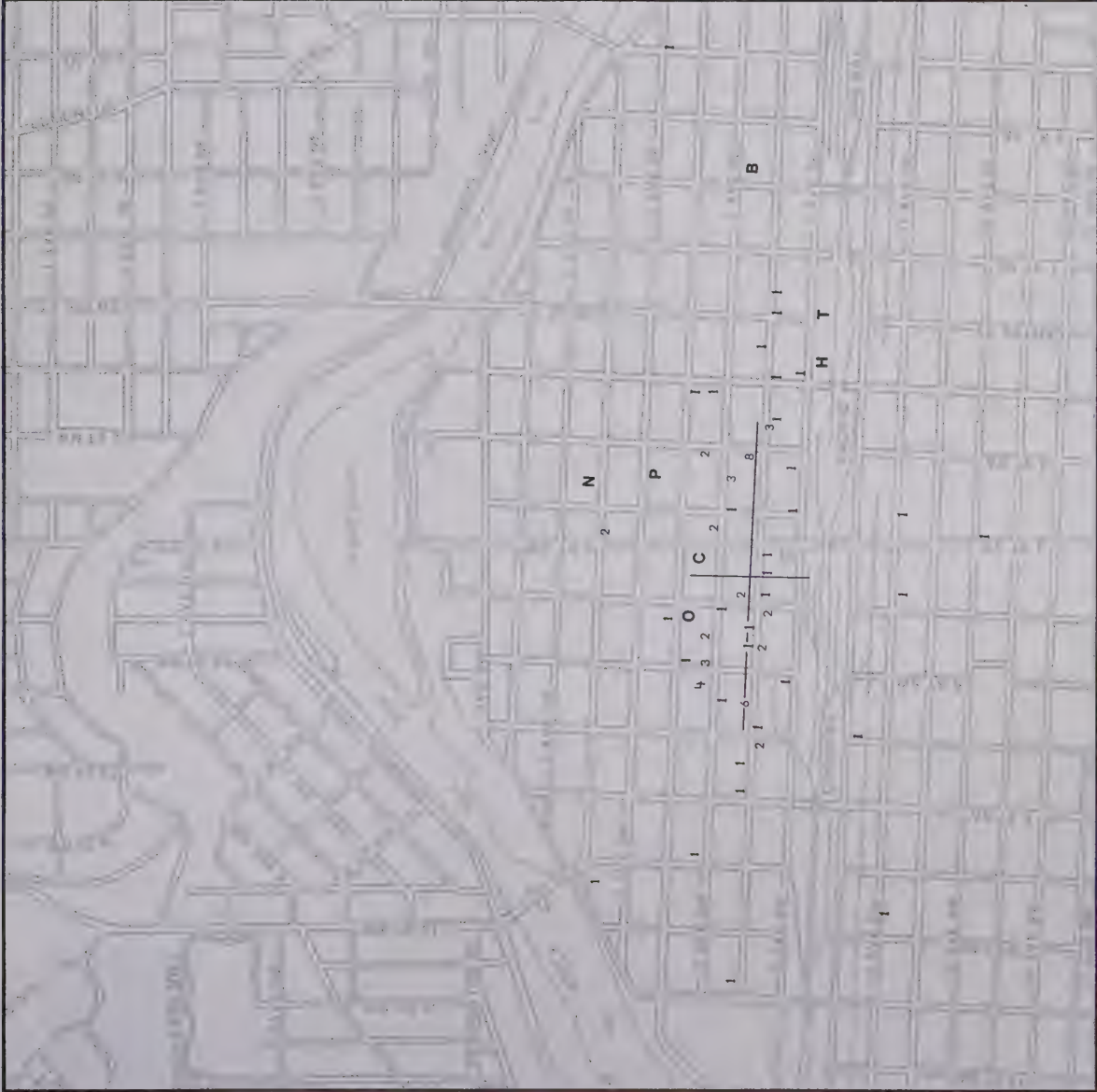
— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 17







**CONSULTANTS-  
GEOLOGICAL, GEOPHYSICAL,  
ENGINEERING,  
LAND, SURVEYING  
DATA PROCESSORS  
1964-65**

**CALGARY**  
CENTRAL AREA EXCLUDED

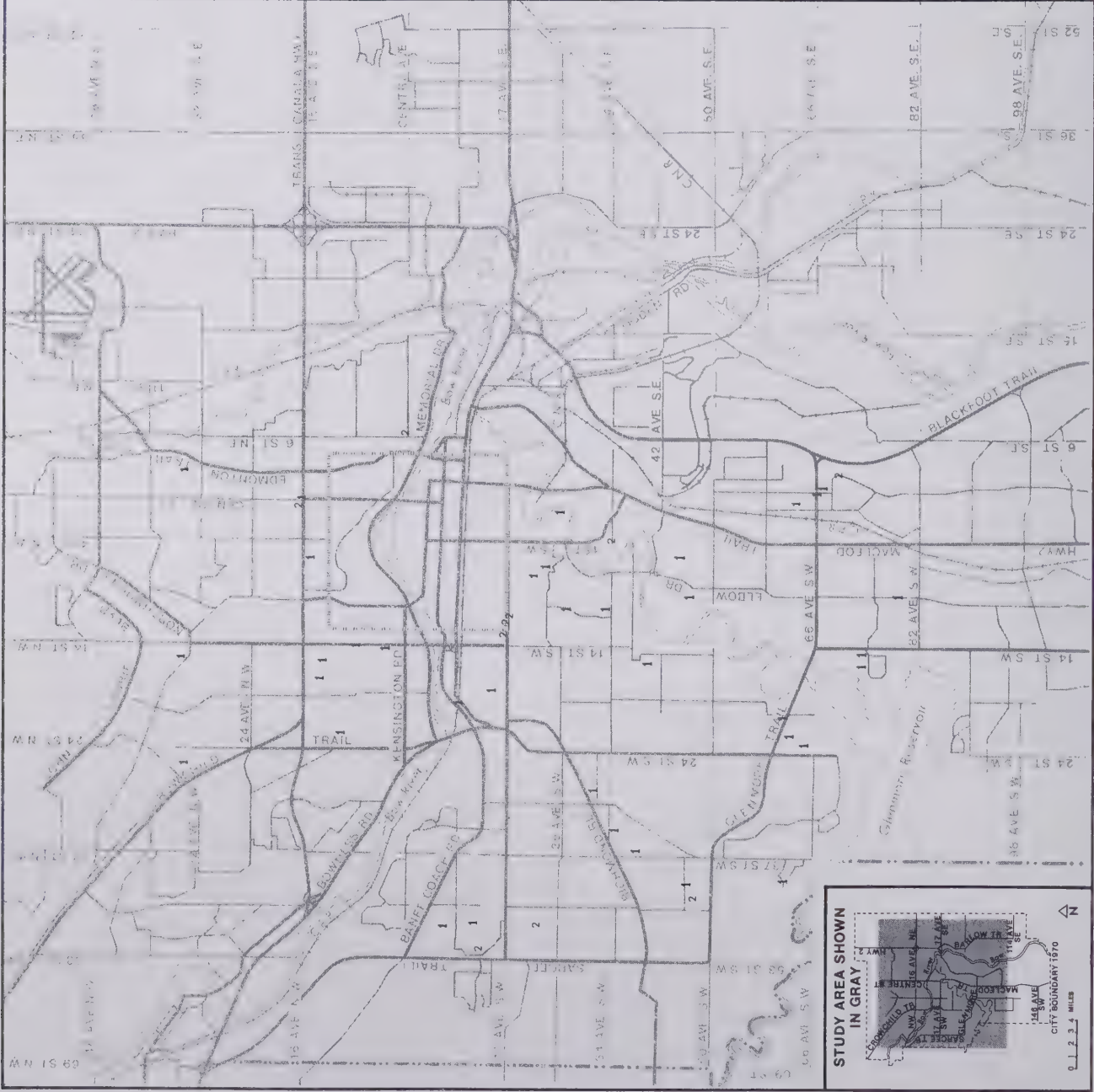
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 18



# CONSULTANTS- GEOLOGICAL, GEOPHYSICAL, ENGINEERING, LAND, SURVEYING

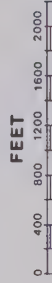
## DATA PROCESSORS 1964-65

### CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

—+— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Paliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 19







**CONSULTANTS-  
GEOLOGICAL, GEOPHYSICAL,  
ENGINEERING,  
LAND, SURVEYING  
DATA PROCESSORS**

**CALGARY**  
**CENTRAL AREA EXCLUDED**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

## CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 20



# CONSULTANTS- GEOLOGICAL, GEOPHYSICAL, ENGINEERING, LAND, SURVEYING

## DATA PROCESSORS 1969-70

### CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

—+— STANDARD DISTANCE  
PARAMETER

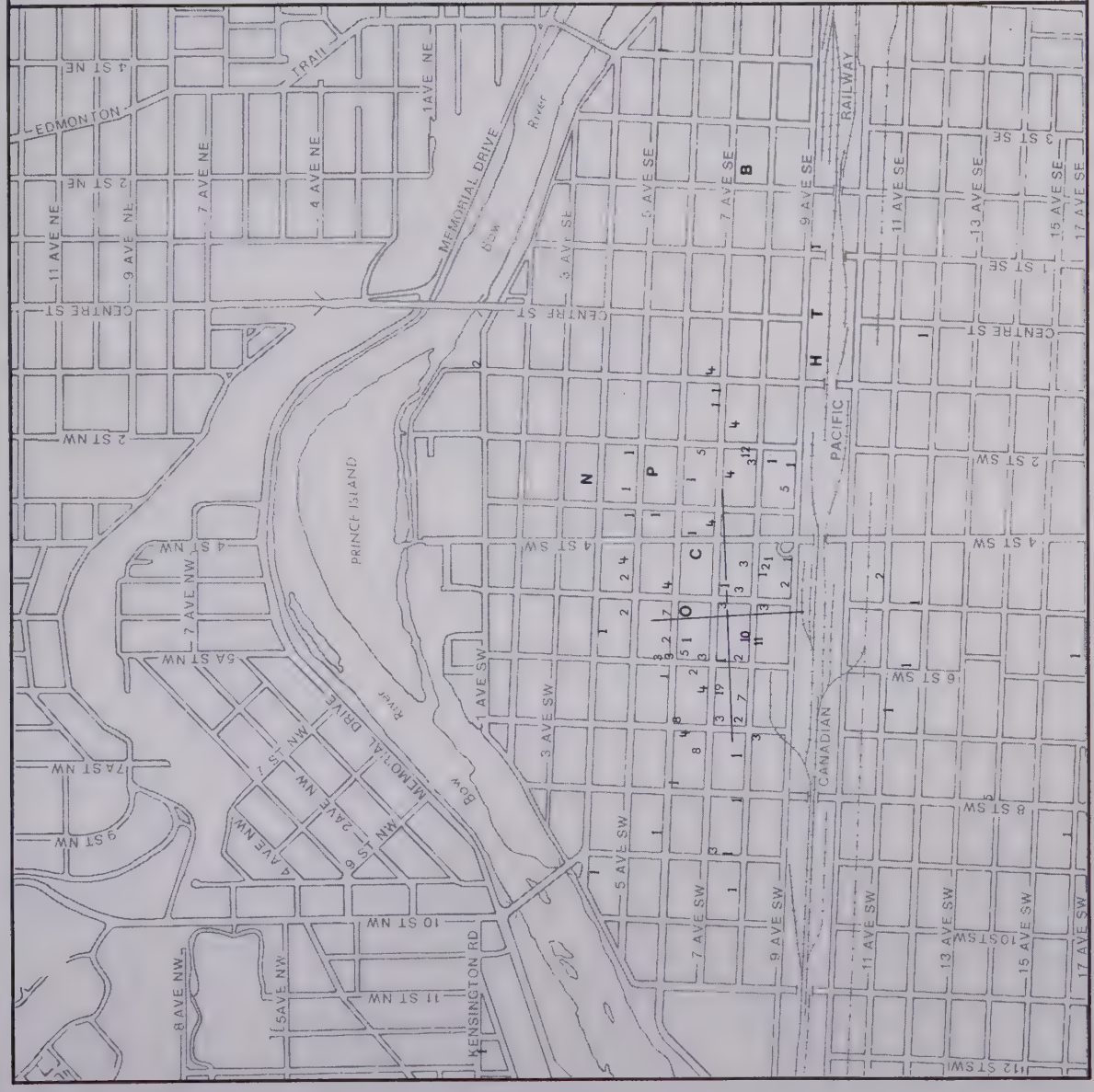
- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 21





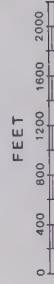
# CONSULTANTS- GEOLOGICAL, GEOPHYSICAL, ENGINEERING, LAND, SURVEYING

## DATA PROCESSORS

### CENTRAL CALGARY

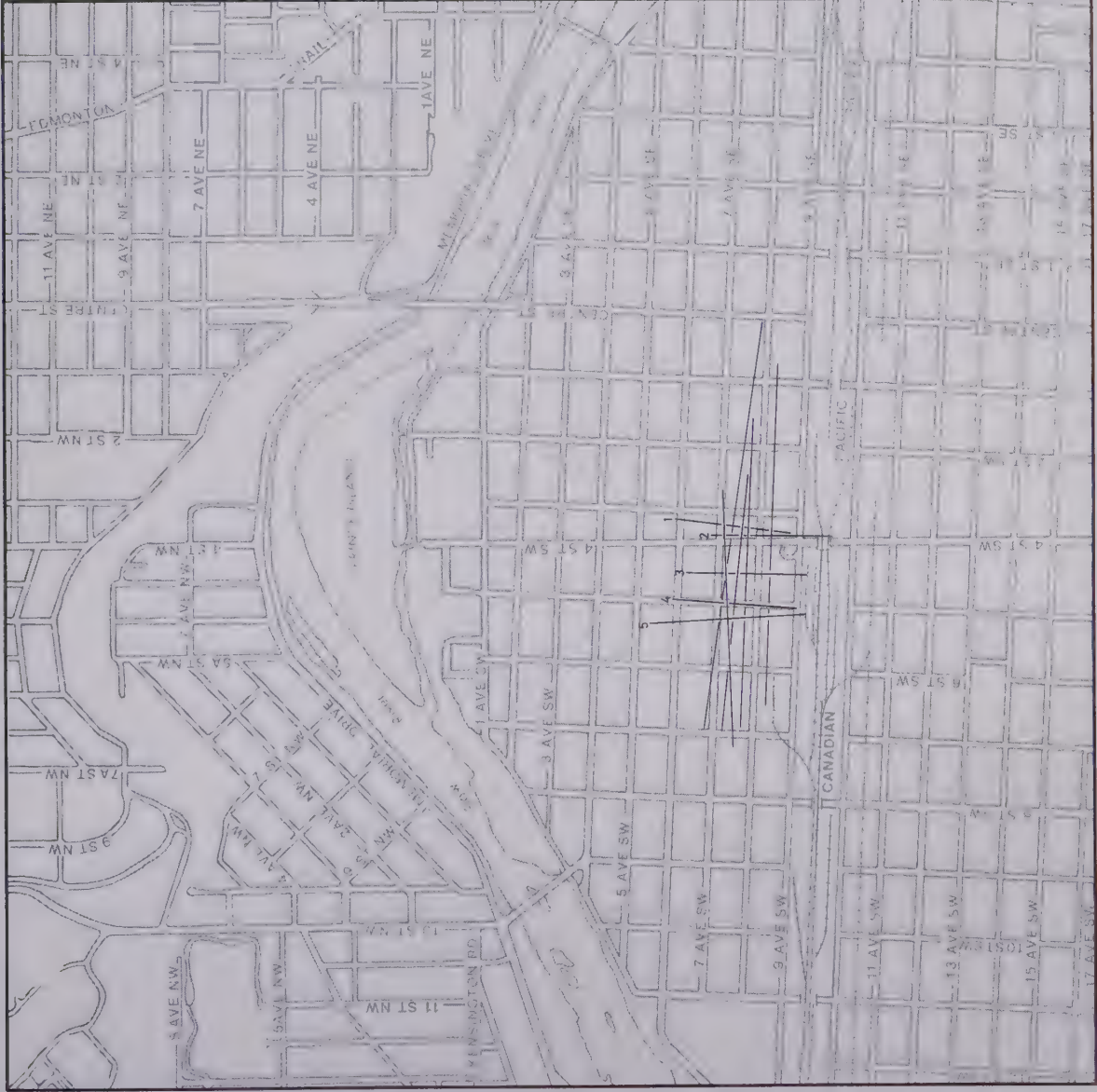
#### STANDARD DISTANCE PARAMETER

1	1950-51
2	1954-55
3	1959-60
4	1964-65
5	1969-70



G. H. Z.

Figure 2.2





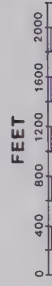
# FINANCIAL AND INVESTMENT 1950-51

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

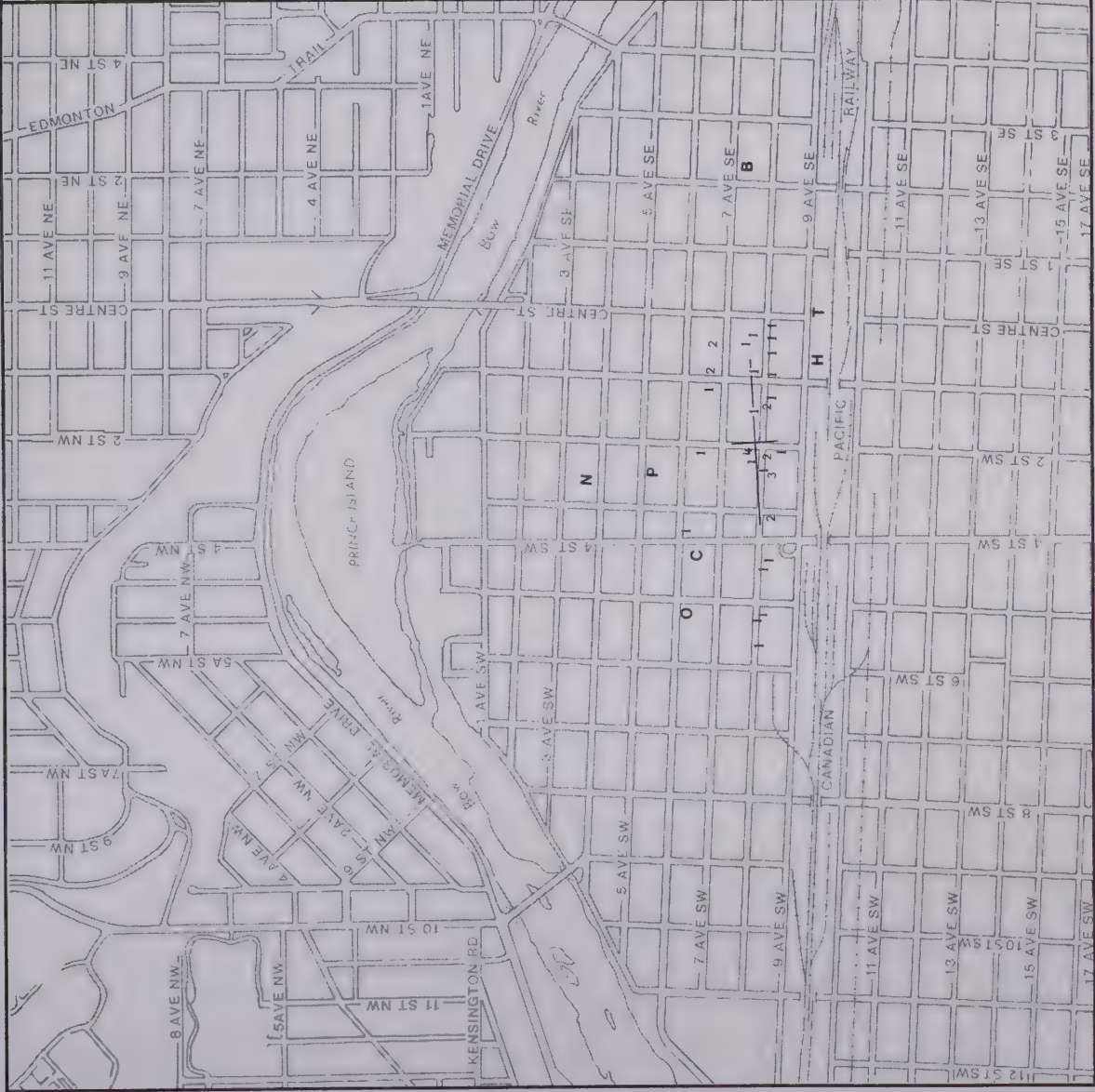
— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- C Palliser Hotel
- H Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 2 3





# FINANCIAL AND INVESTMENT 1954-55

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 24





# FINANCIAL AND INVESTMENT

1959-60

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 2.5







# FINANCIAL AND INVESTMENT

1964-65

CALGARY  
CENTRAL AREA EXCLUDED

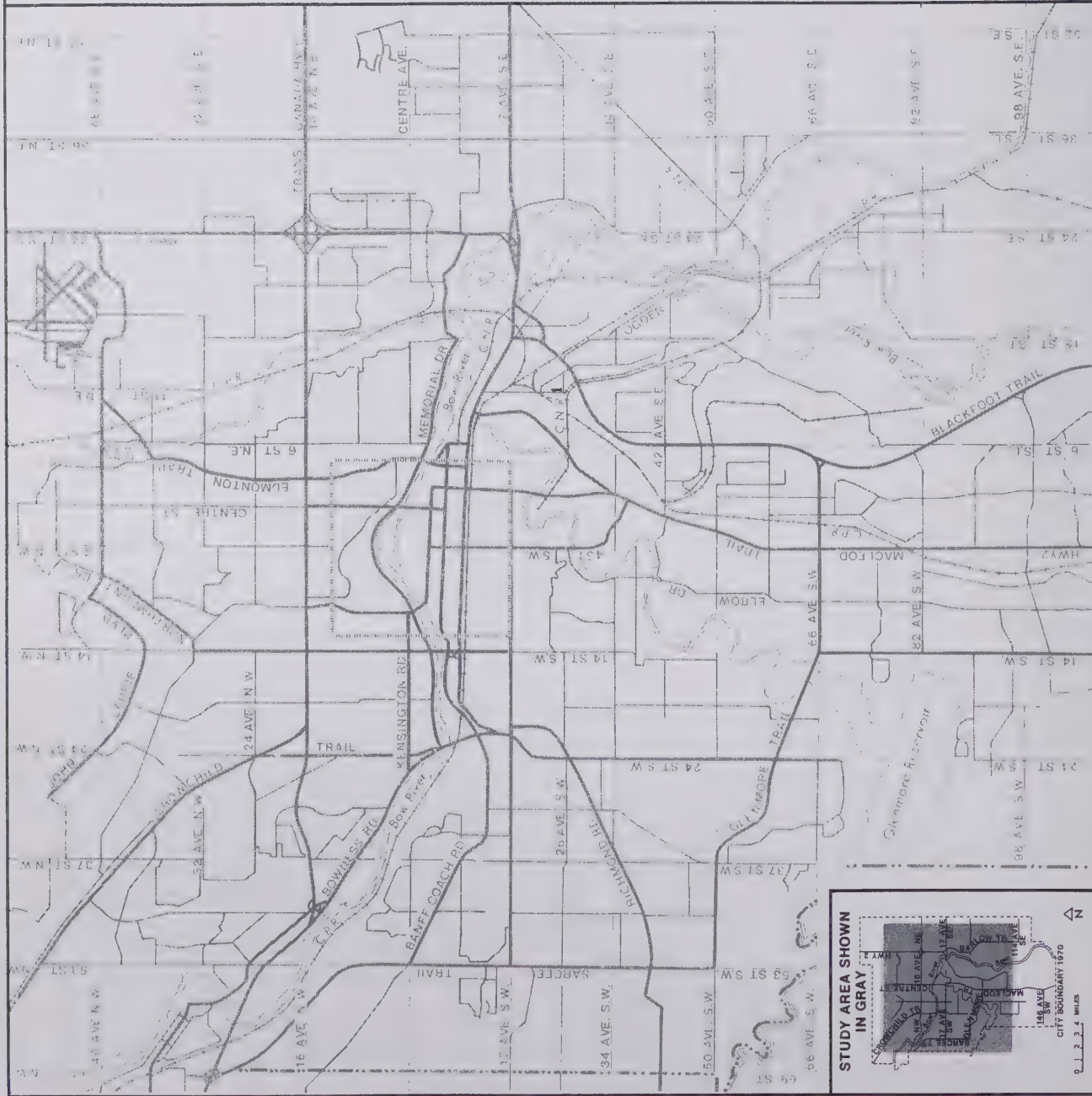
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

— CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 2 6



# FINANCIAL AND INVESTMENT 1964-65 CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 27





# FINANCIAL AND INVESTMENT

1969-70

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

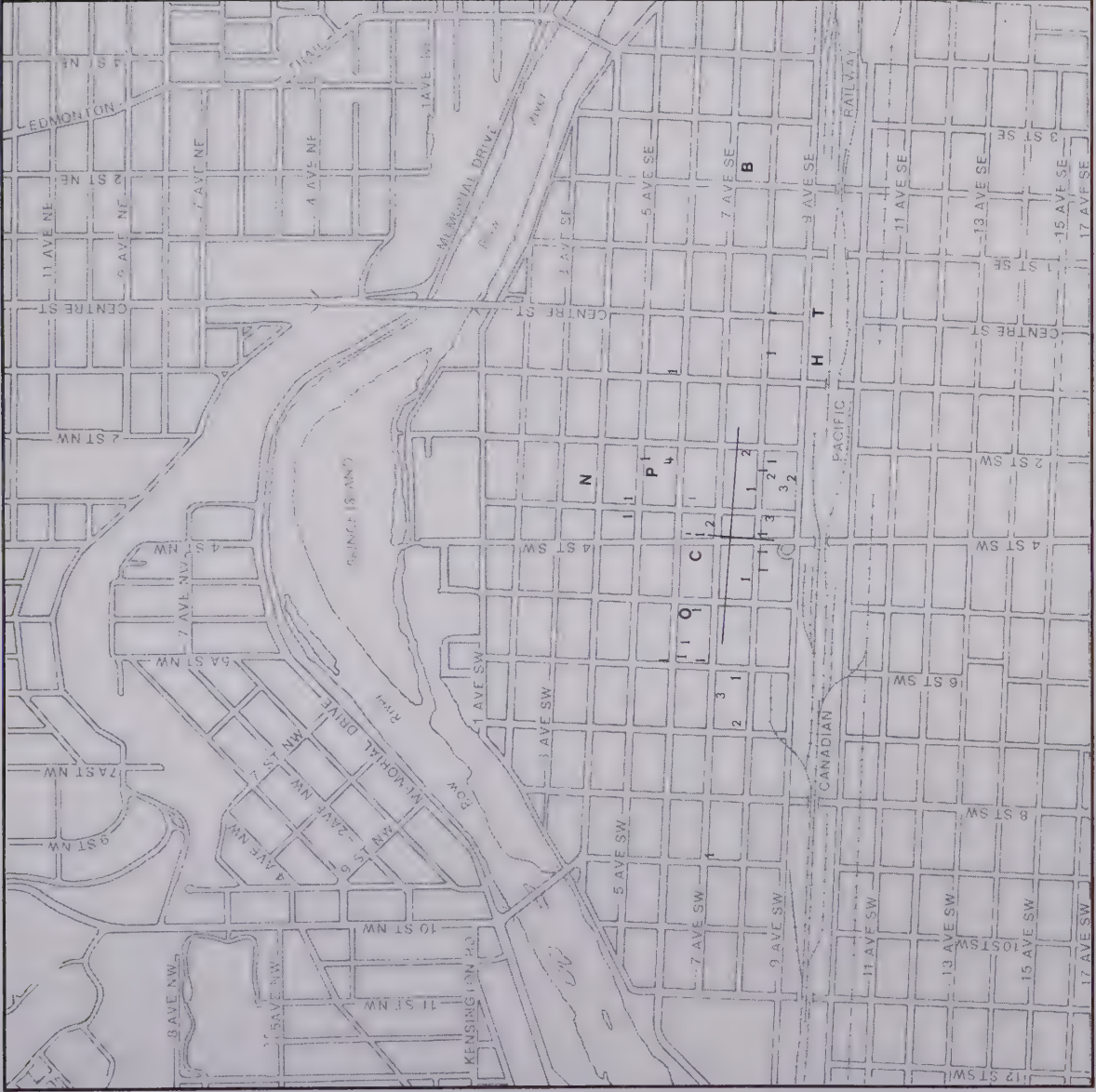
- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 28





STANDARD DISTANCE  
PARAMETER

1	1950-51
2	1954-55
3	1959-60
4	1964-65
5	1969-70

1331



G. H. Z.

Figure 29





**LEASE BROKERS,  
LAND AGENTS**

1950-51

**CALGARY**  
**CENTRAL AREA EXCLUDED**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

## CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER

Figure 30



# LEASE BROKERS, LAND AGENTS

1950-51

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 31







**LEASE BROKERS,  
LAND AGENTS  
1954-55**

**CALGARY**  
**CENTRAL AREA EXCLUDED**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 32



# LEASE BROKERS, LAND AGENTS

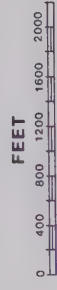
1954-55

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

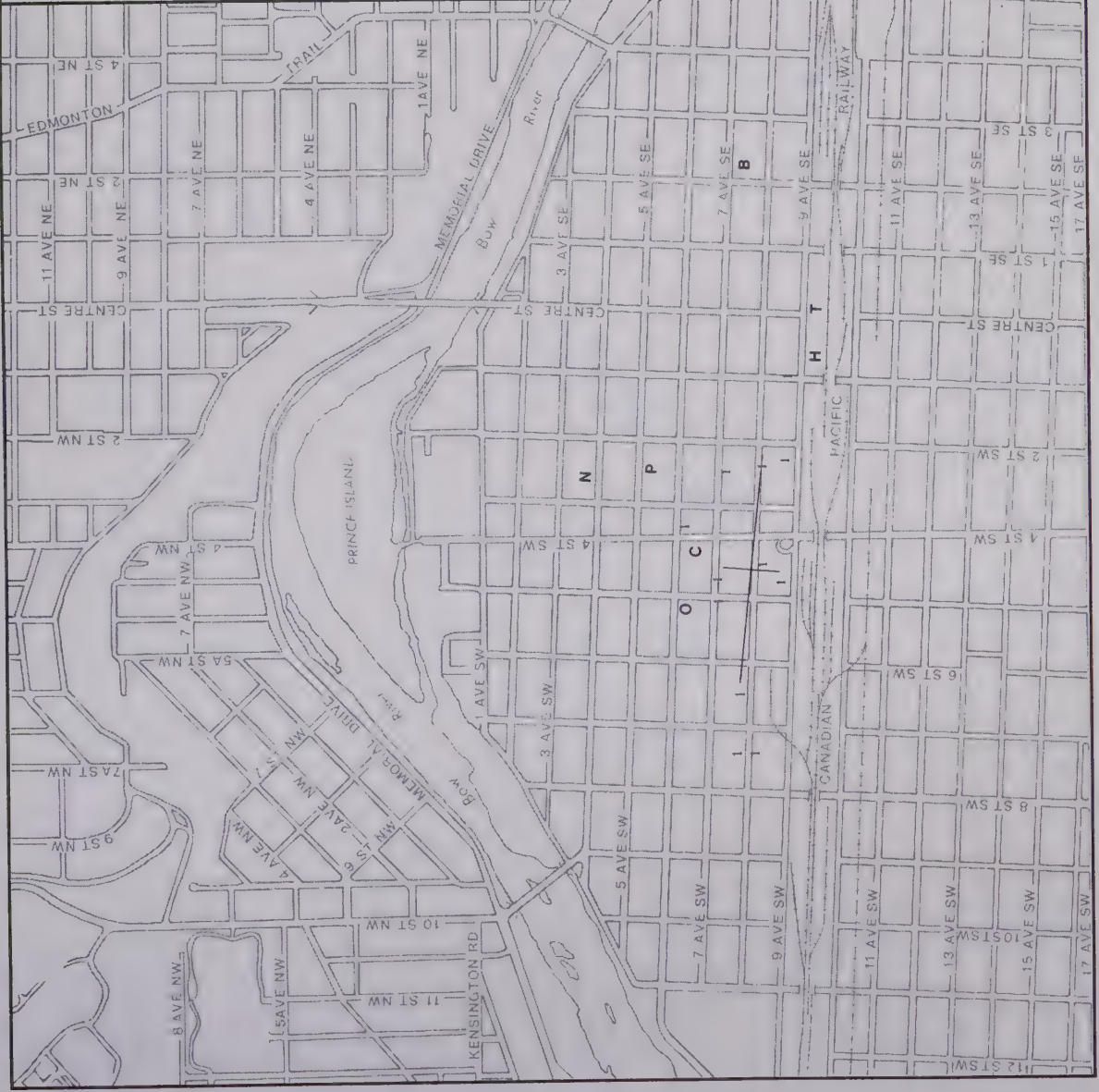
- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 33







# LEASE BROKERS, LAND AGENTS 1959-60

CALGARY  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE: NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 34



# LEASE BROKERS, LAND AGENTS 1959-60

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 3 5







# LEASE BROKERS, LAND AGENTS

1964-65

CALGARY  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 36



# LEASE BROKERS, LAND AGENTS

1964-65

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 37







**CALGARY**  
**CENTRAL AREA EXCLUDED**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

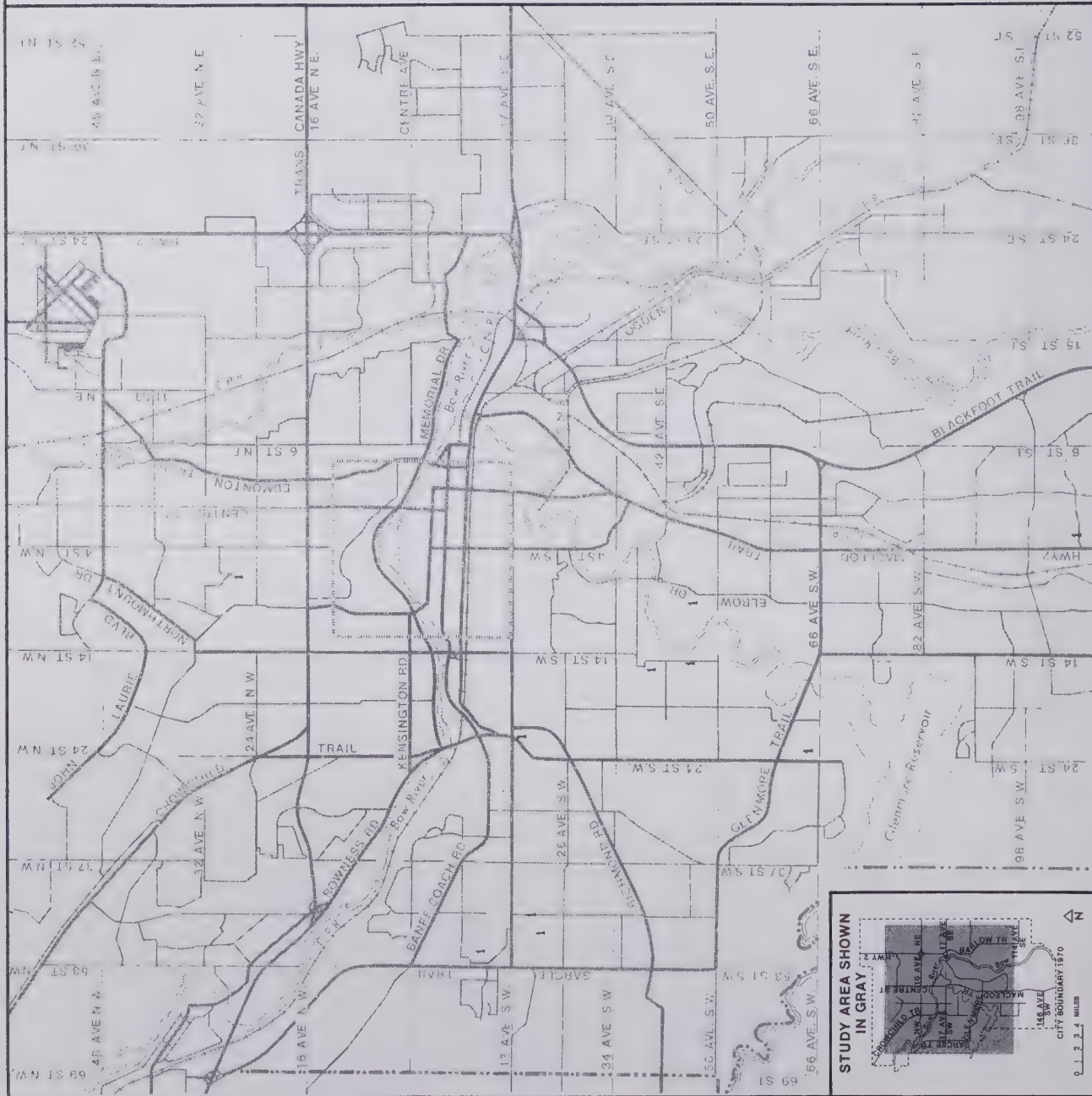
CENTRAL AREA

A vertical scale bar labeled "FEET" with markings from 0 to 12,000 in increments of 2,000.

SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 38



# LEASE BROKERS, LAND AGENTS

1969-70

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 39





# LEASE BROKERS, LAND AGENTS

## CENTRAL CALGARY

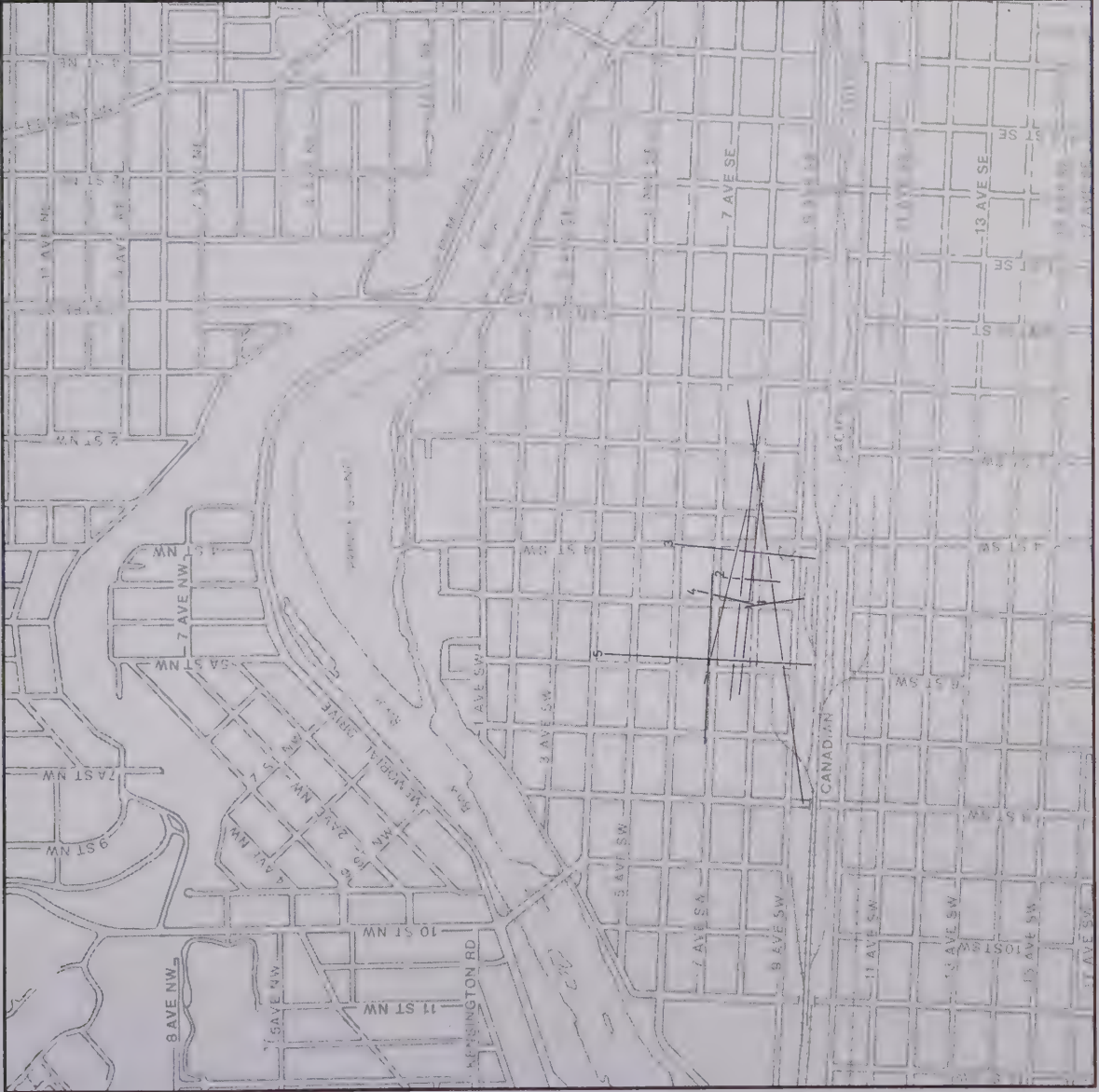
### STANDARD DISTANCE PARAMETER

1	1950-51
2	1954-55
3	1959-60
4	1964-65
5	1969-70



G. H. Z.

Figure 40





ADMINISTRATIVE OIL OFFICES,  
EDMONTON





# PRODUCERS, EXPLORERS, DEVELOPERS

1950-51

EDMONTON  
CENTRAL AREA EXCLUDED

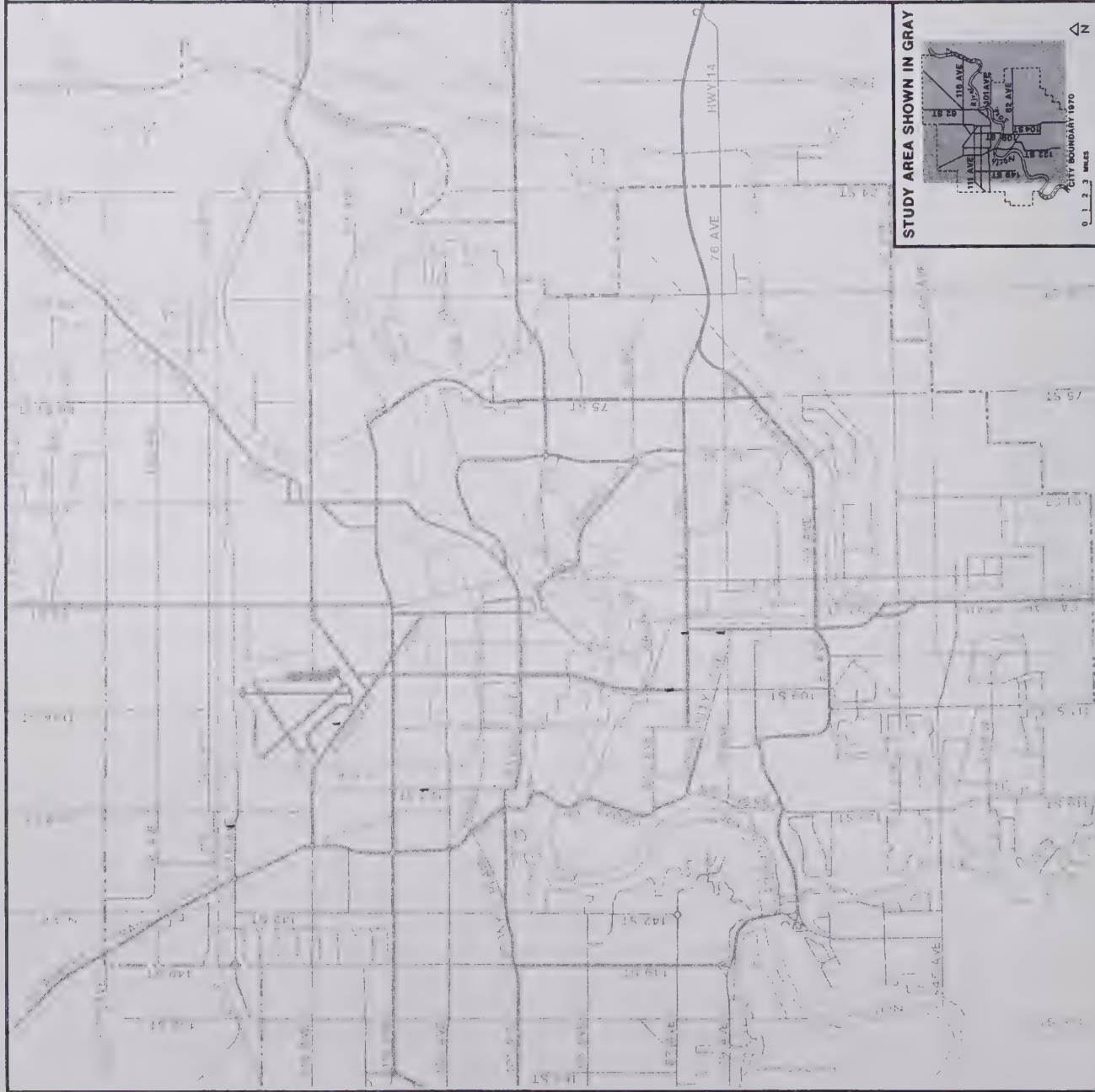
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

———— CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 41



# PRODUCERS, EXPLORERS, DEVELOPERS

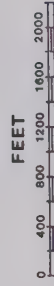
1950-51

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

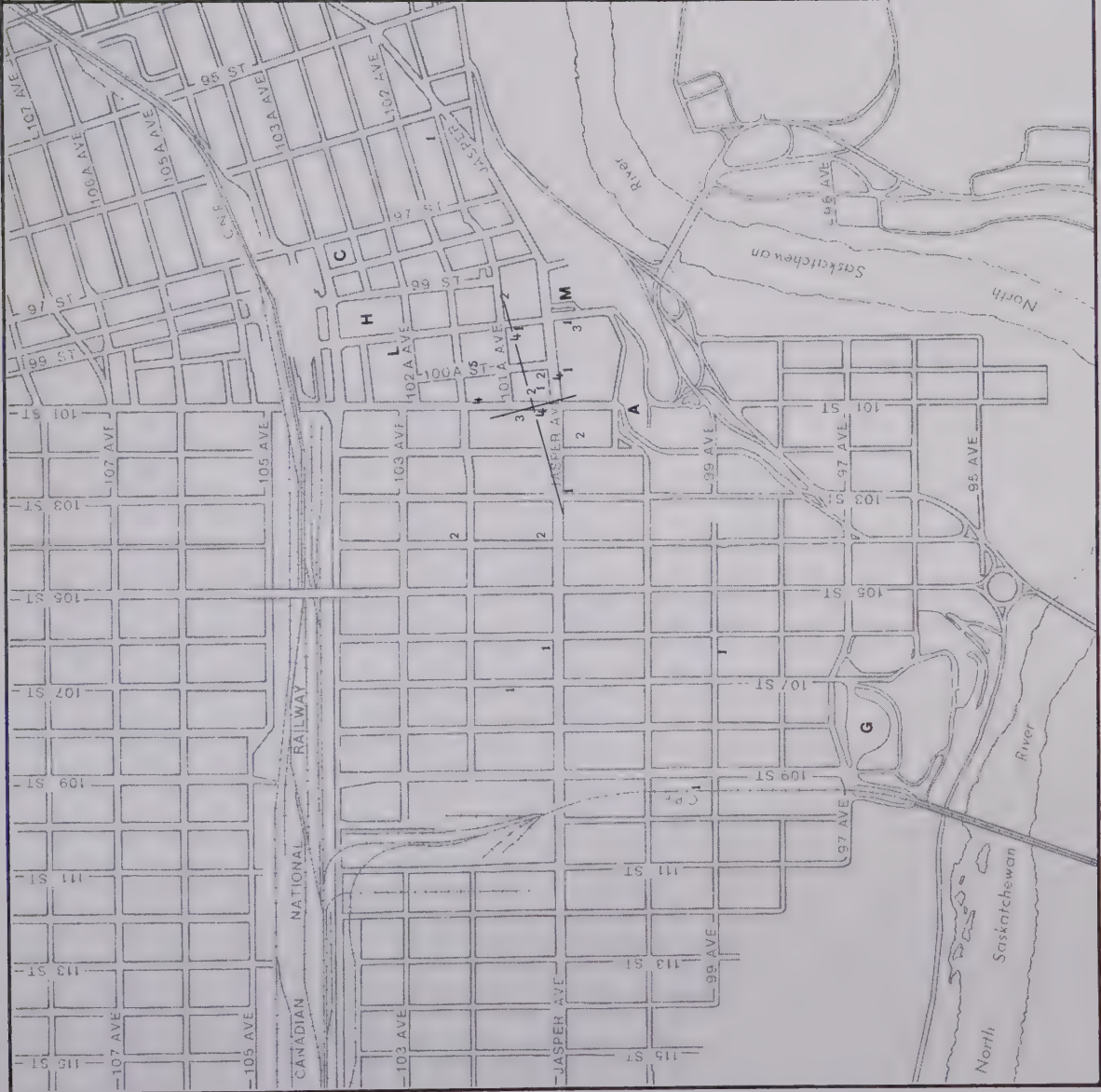
— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 4 2







# PRODUCERS, EXPLORERS, DEVELOPERS

1954-55

EDMONTON  
CENTRAL AREA EXCLUDED

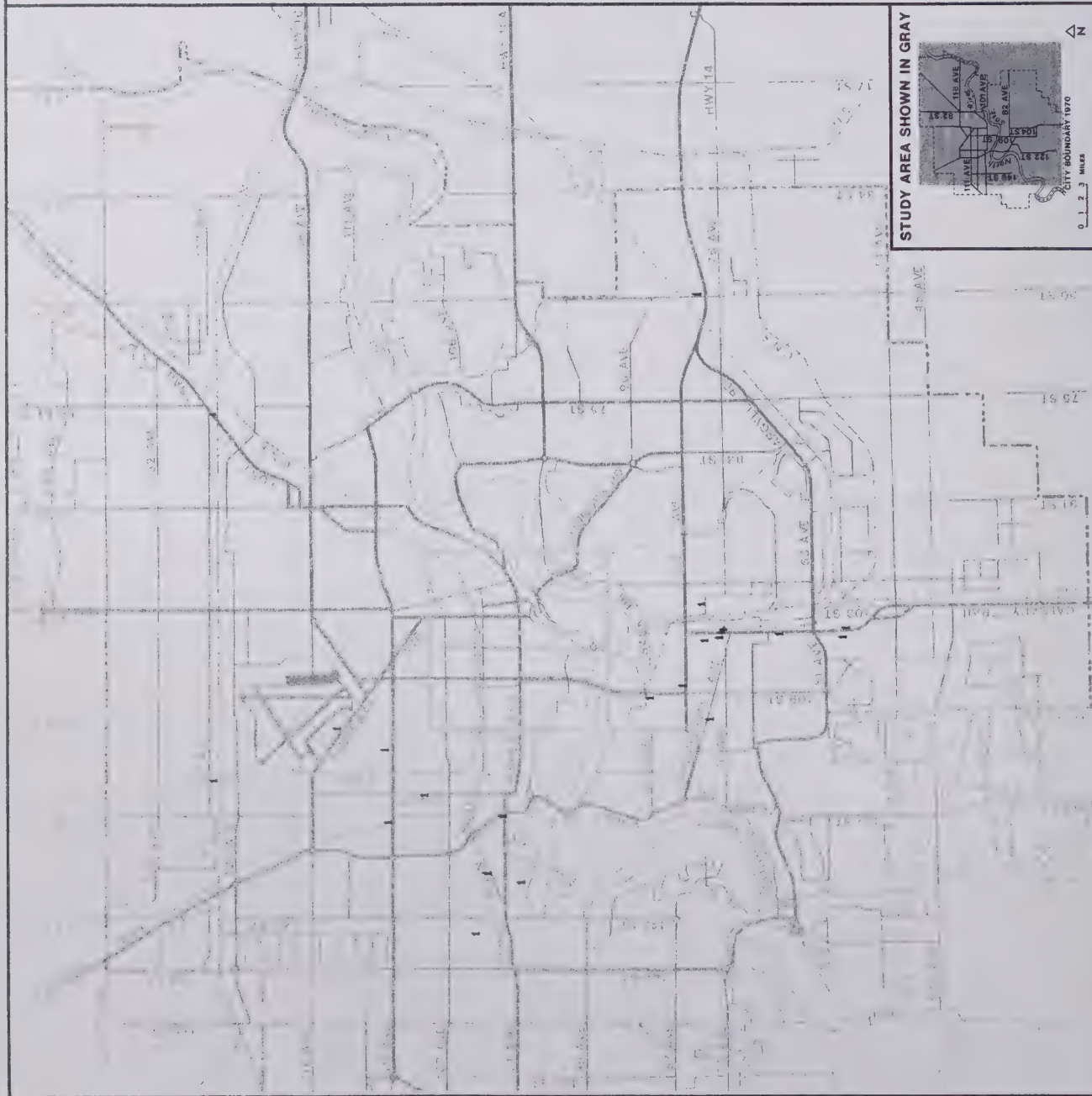
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

— CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 4.3



# PRODUCERS, EXPLORERS, DEVELOPERS

1954-55

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

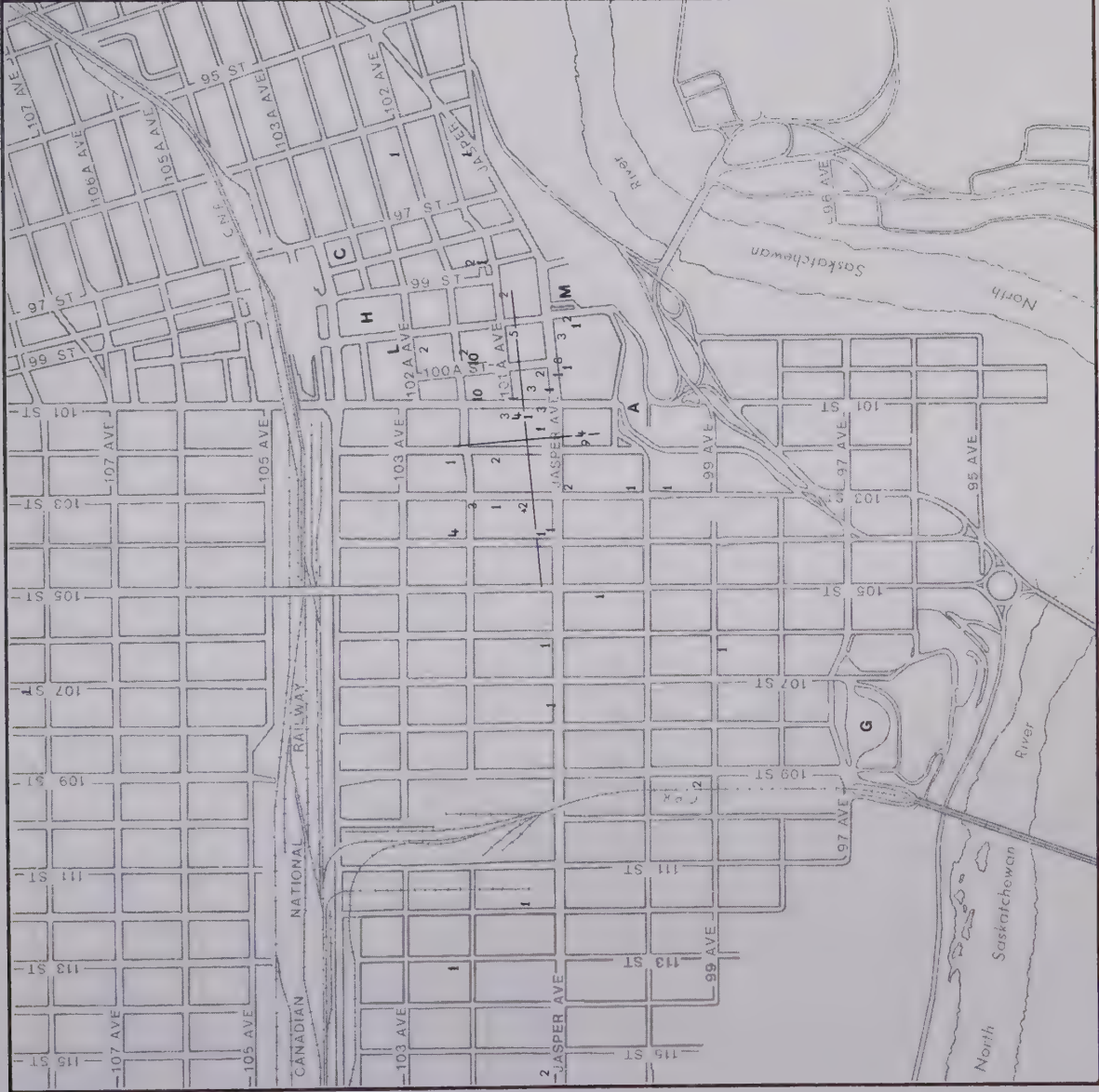
— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 4-4







# PRODUCERS, EXPLORERS, DEVELOPERS

1959-60

EDMONTON  
CENTRAL AREA EXCLUDED

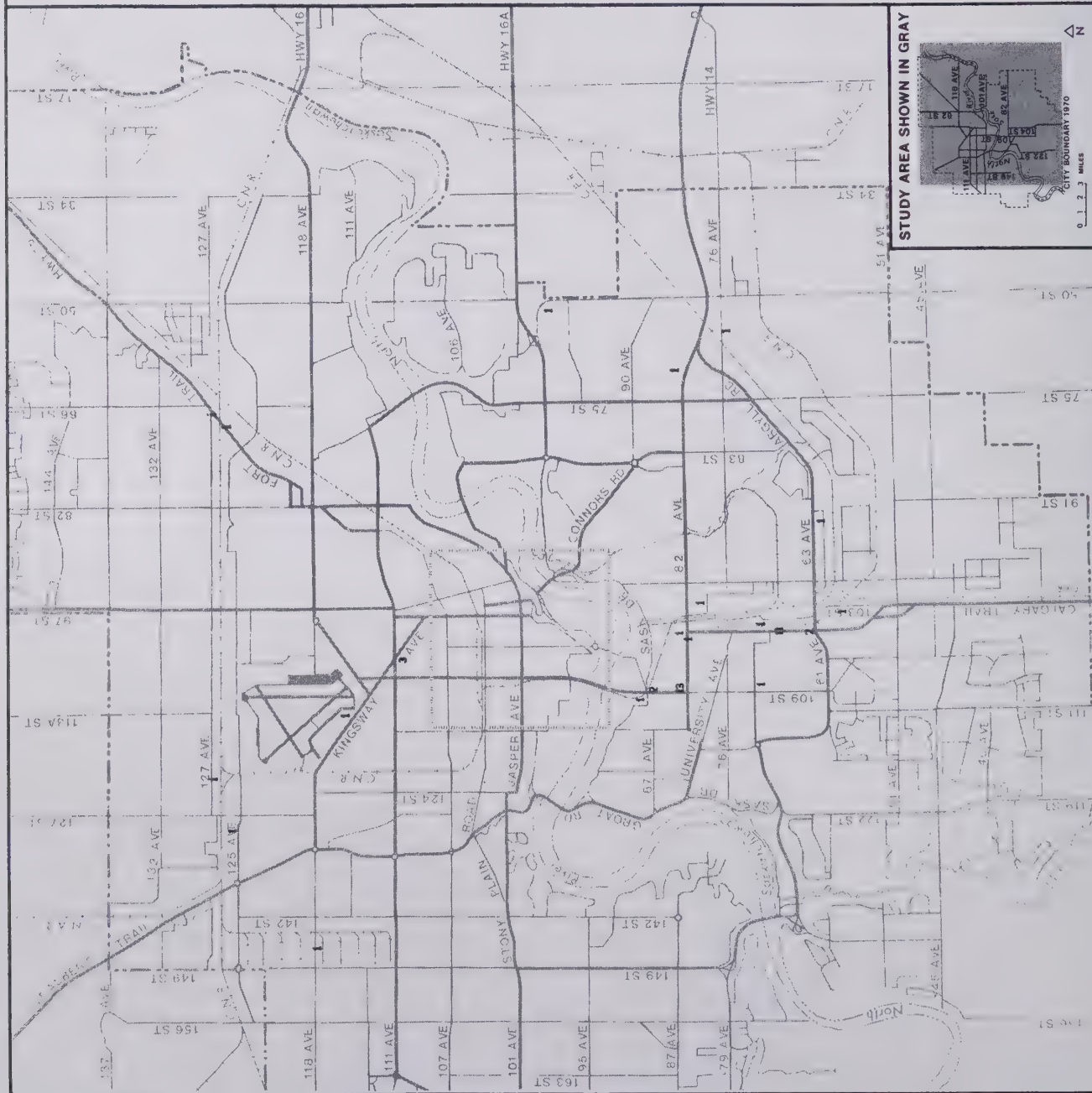
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 4 5



# PRODUCERS, EXPLORERS, DEVELOPERS

1959-60

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

—+— STANDARD DISTANCE  
PARAMETER

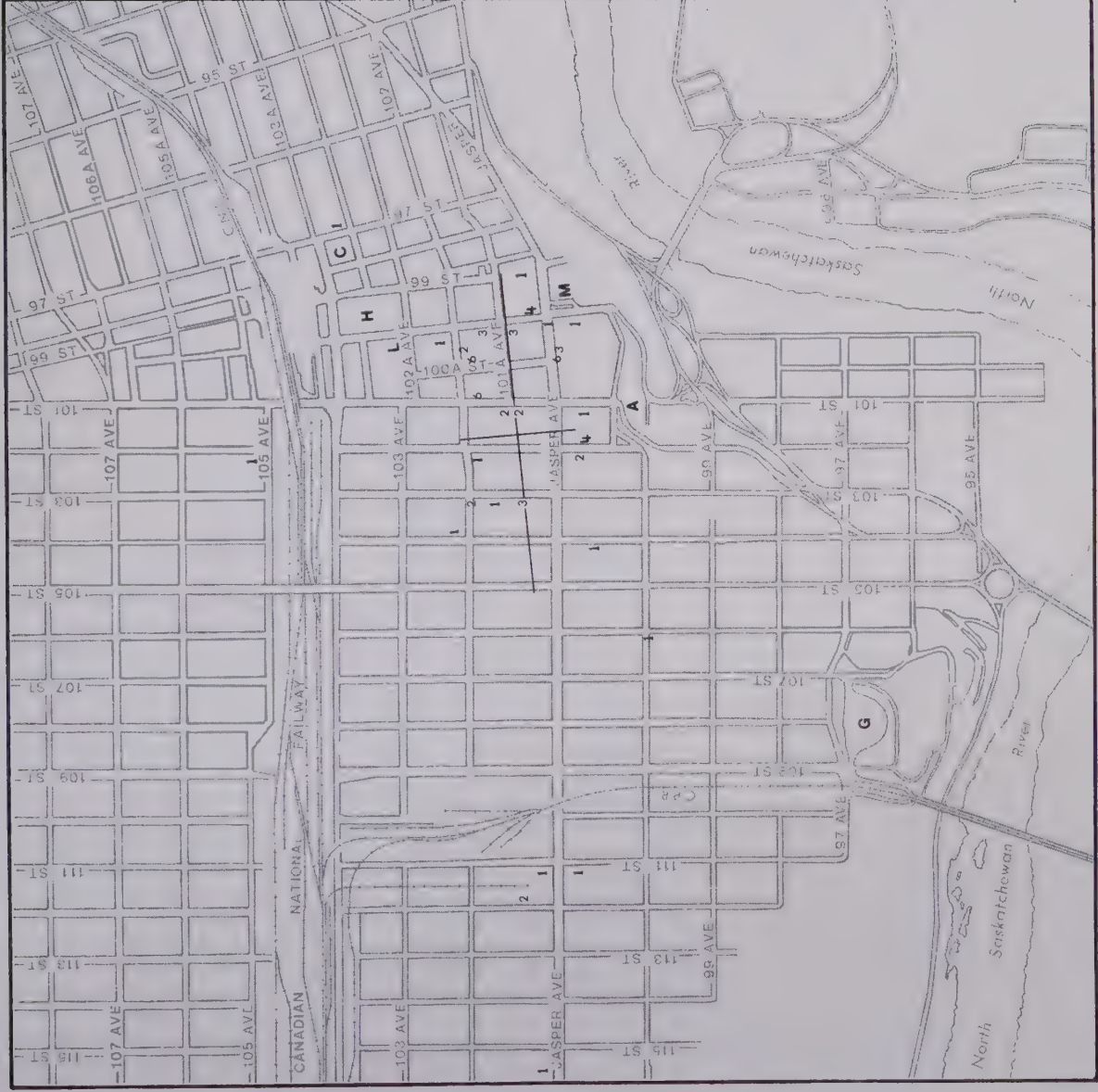
- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 4 6









# PRODUCERS, EXPLORERS, DEVELOPERS

1964-65

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

—+— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 48







## 1969-70

**EDMONTON**  
**CENTRAL AREA EXCLUDED**

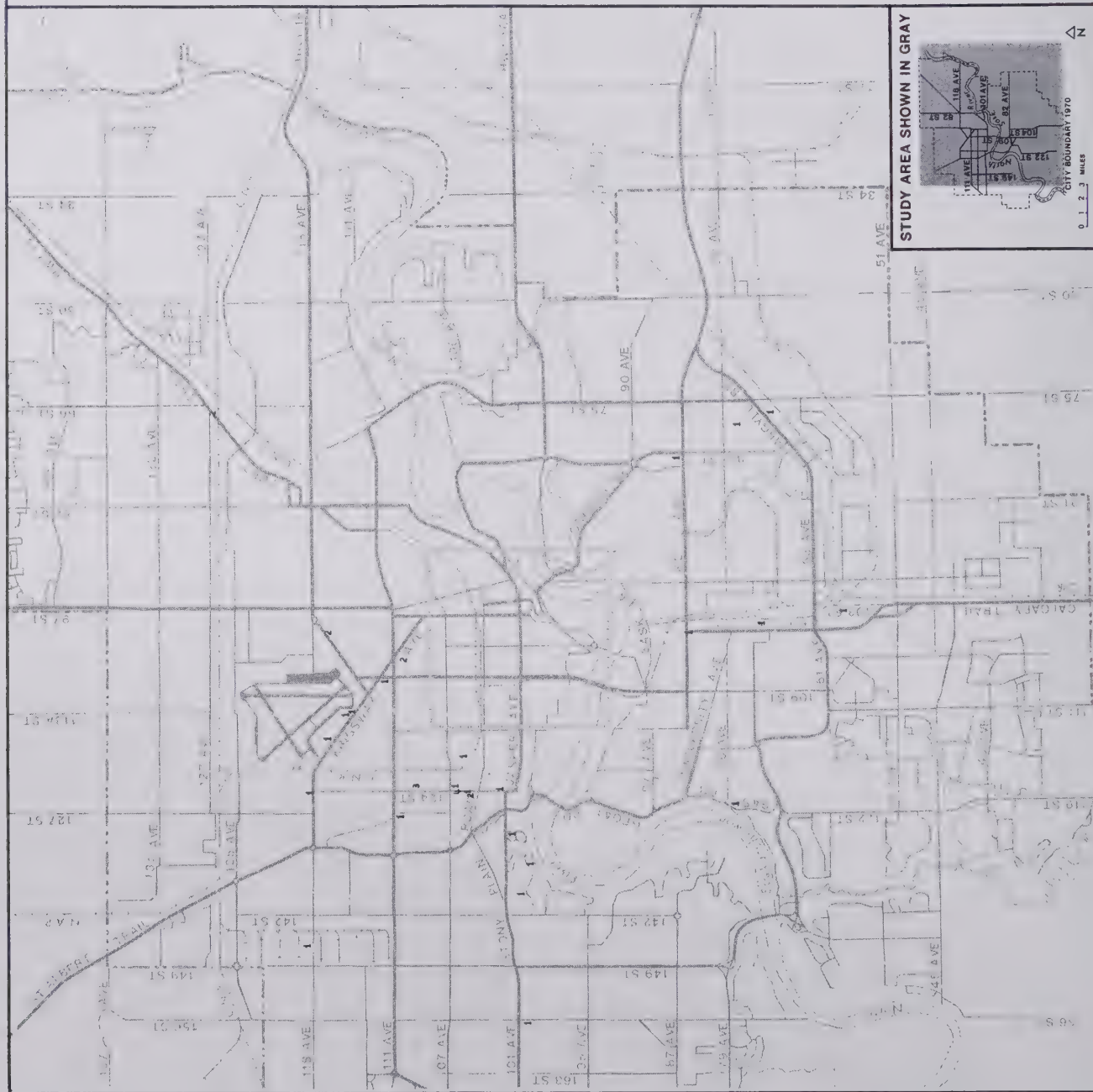
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER

Figure 49



# PRODUCERS, EXPLORERS, DEVELOPERS

1969-70

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

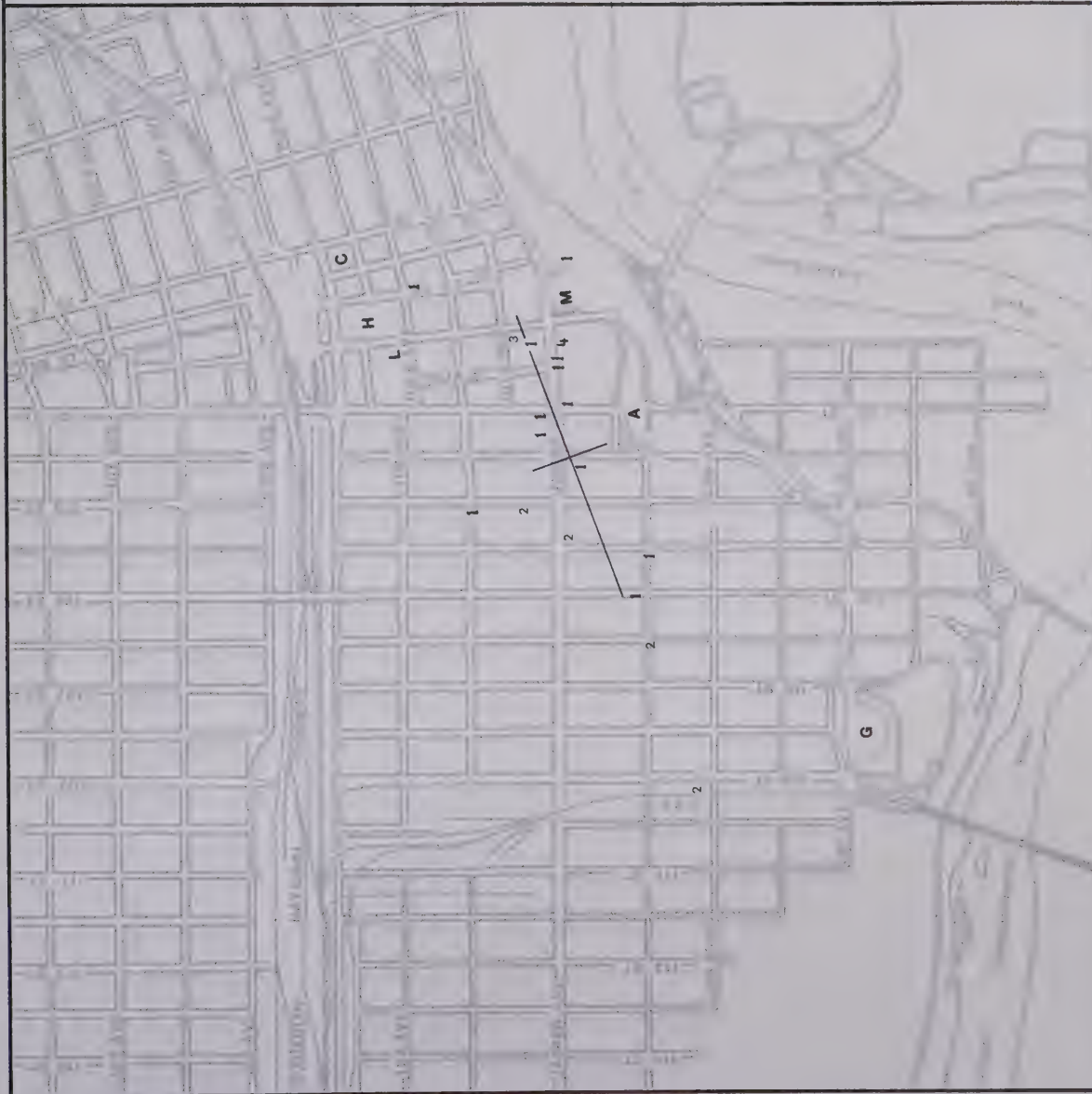
— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 50





# PRODUCERS, EXPLORERS, DEVELOPERS

## CENTRAL EDMONTON

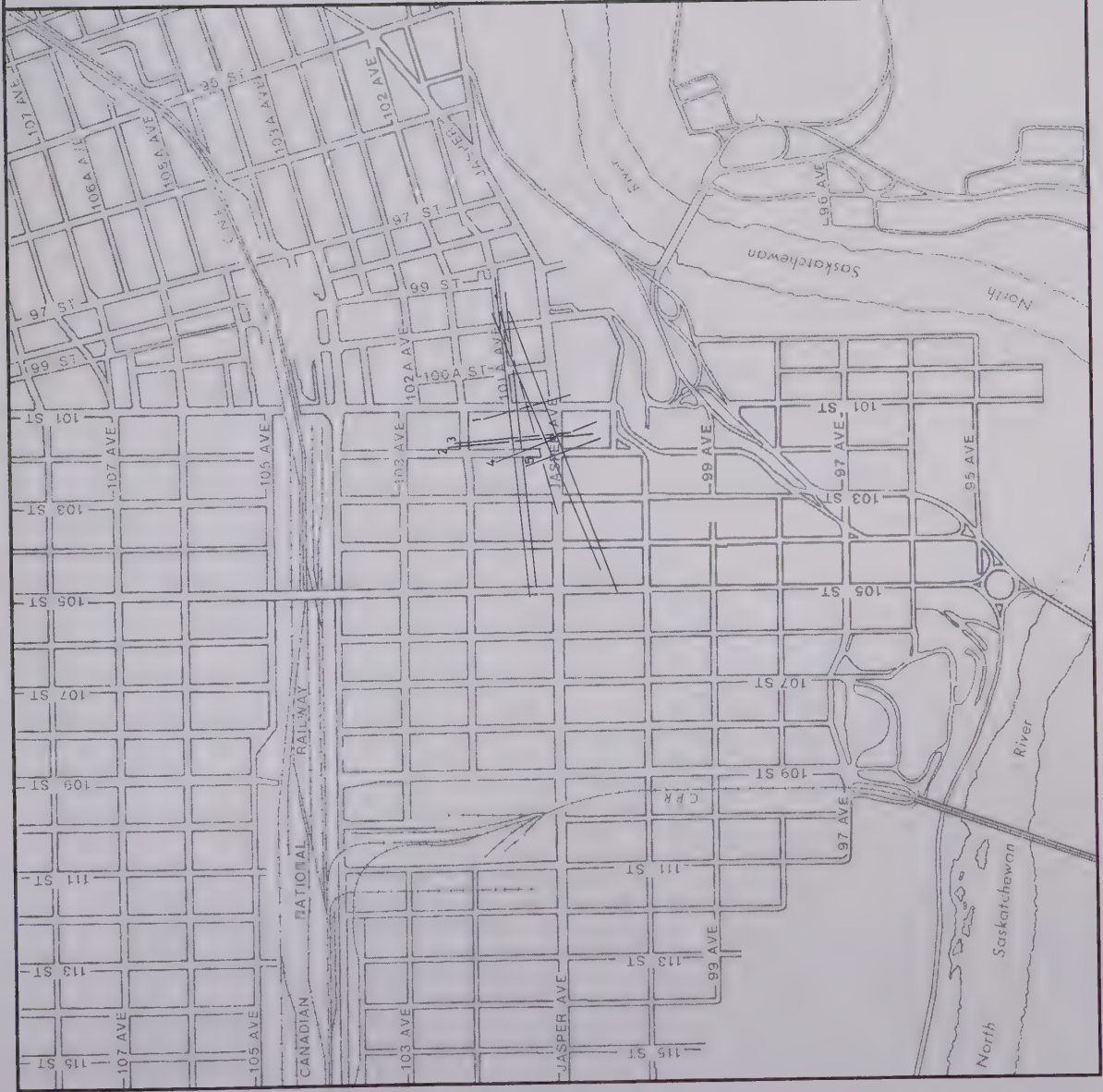
### STANDARD DISTANCE PARAMETER

- |   |         |
|---|---------|
| 1 | 1950-51 |
| 2 | 1954-55 |
| 3 | 1959-60 |
| 4 | 1964-65 |
| 5 | 1969-70 |



G. H. Z.

Figure 51







# CONSULTANTS- GEOLOGICAL, GEOPHYSICAL, ENGINEERING, LAND, SURVEYING DATA PROCESSORS

1950-51

EDMONTON  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 52



# CONSULTANTS-

GEOLOGICAL, GEOPHYSICAL,

ENGINEERING,

LAND, SURVEYING

## DATA PROCESSORS

1950-51

### CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

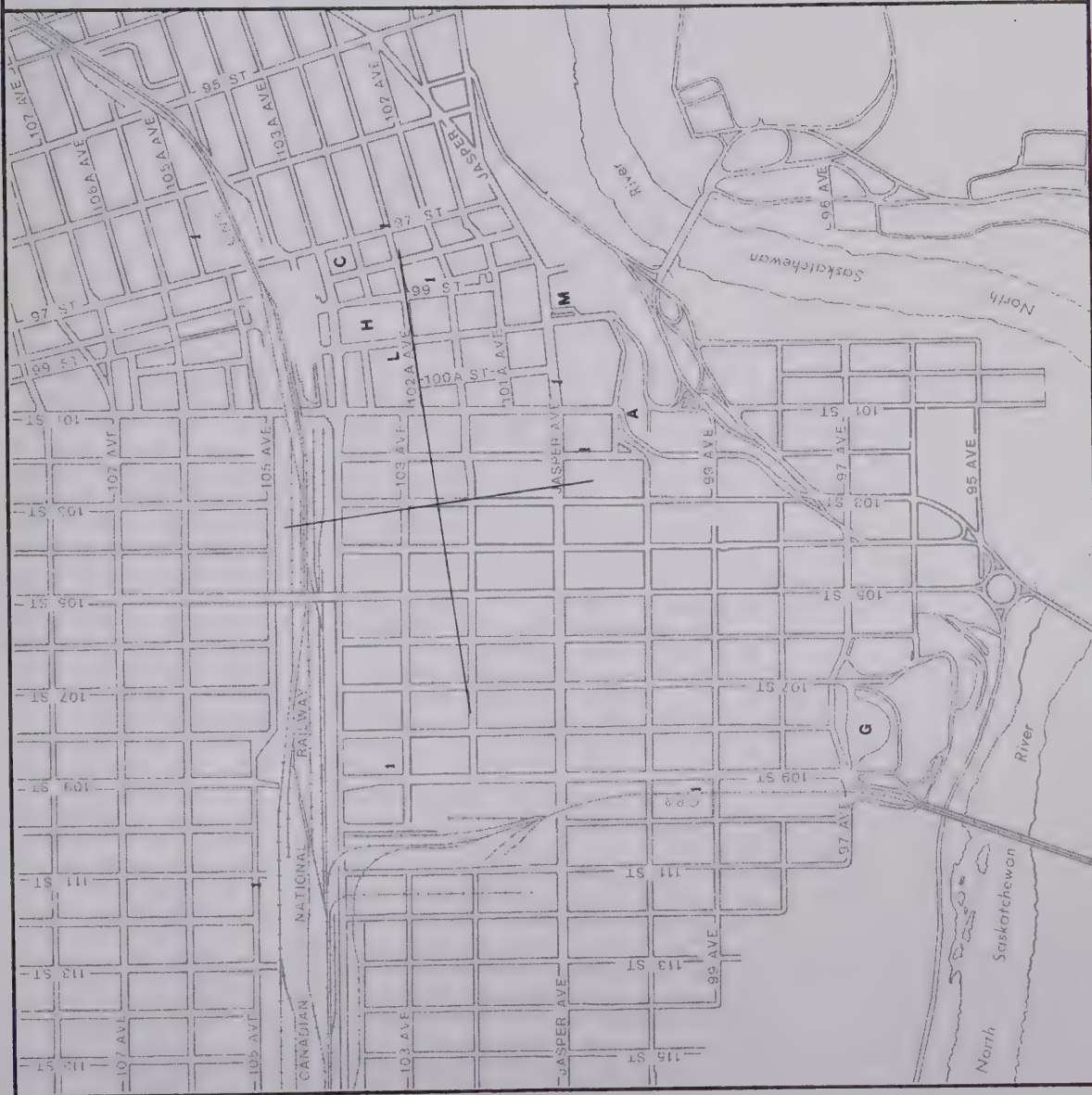
- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 5 3







# CONSULTANTS- GEOLOGICAL, GEOPHYSICAL, ENGINEERING, LAND, SURVEYING DATA PROCESSORS

1954-55

EDMONTON  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 54



# CONSULTANTS- GEOLOGICAL, GEOPHYSICAL, ENGINEERING, LAND, SURVEYING DATA PROCESSORS

1954-55

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

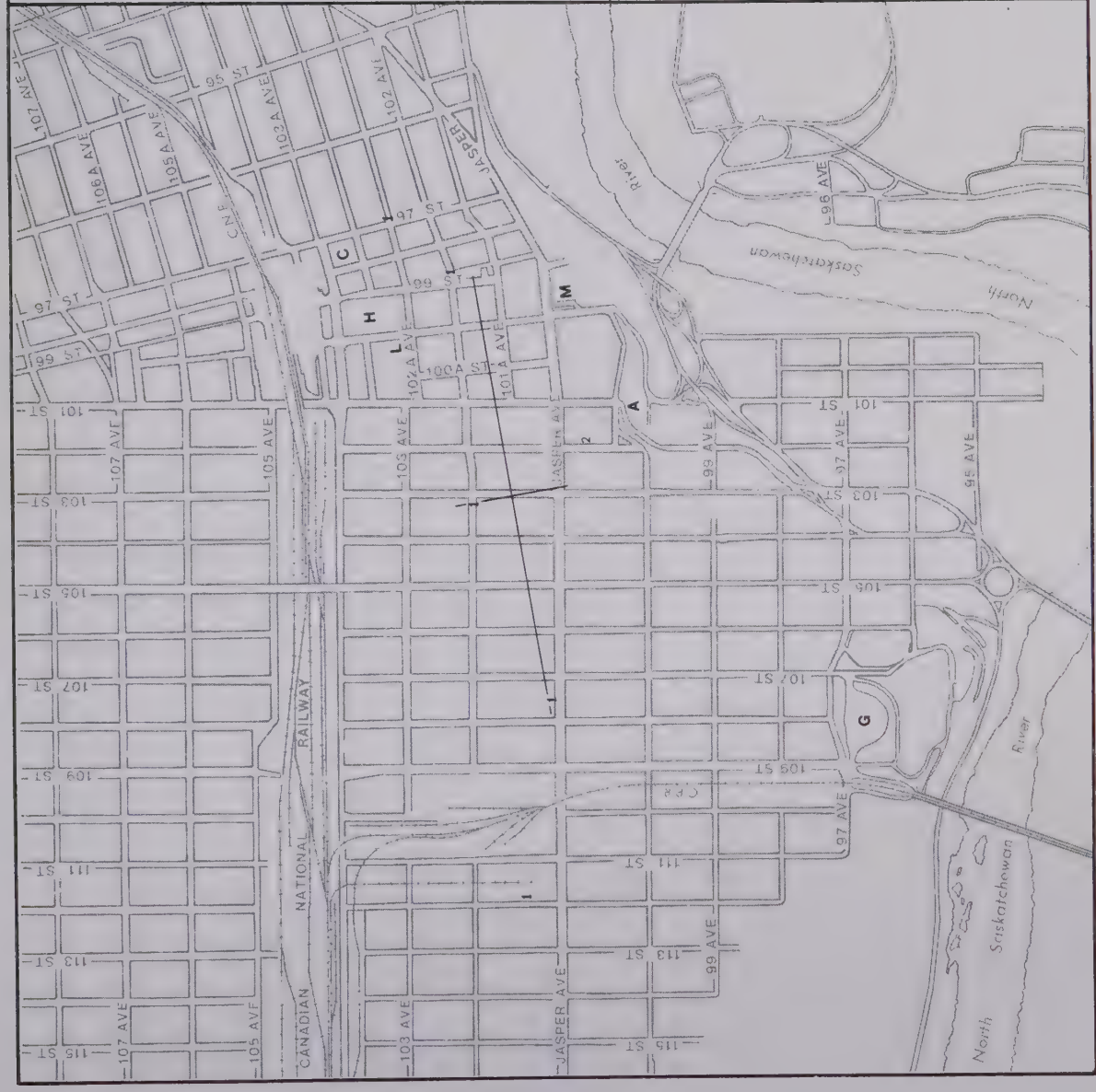
— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 55







# CONSULTANTS- GEOLOGICAL, GEOPHYSICAL, ENGINEERING, LAND, SURVEYING DATA PROCESSORS

1959-60

EDMONTON  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

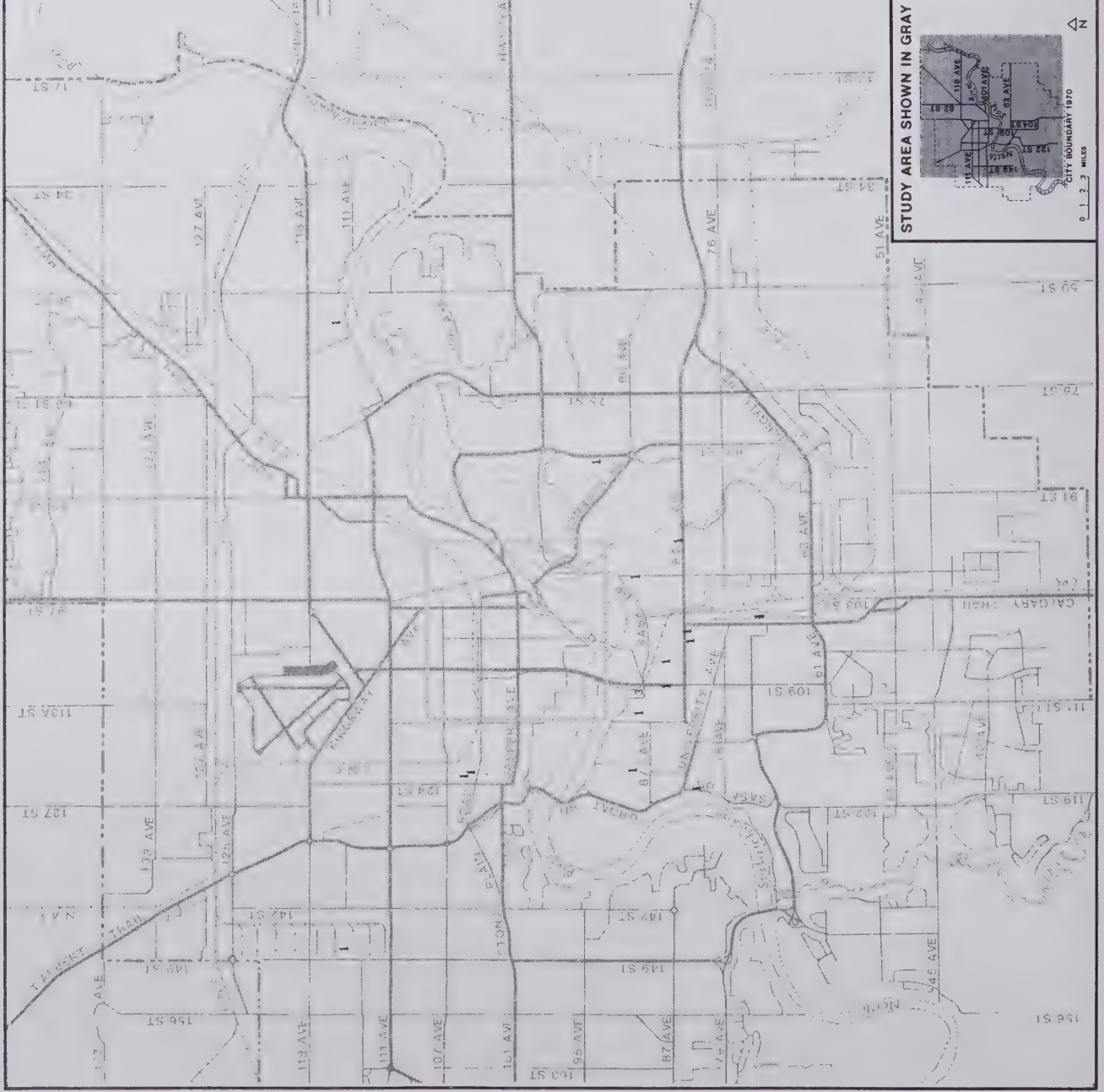


Figure 56

**CONSULTANTS-  
GEOLOGICAL, GEOPHYSICAL,  
ENGINEERING,  
LAND, SURVEYING**

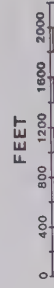
**DATA PROCESSORS  
1959-60**

**CENTRAL EDMONTON**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

—+— STANDARD DISTANCE  
PARAMETER

- |   |                              |
|---|------------------------------|
| H | City Hall                    |
| L | Land Titles Office           |
| C | Court House                  |
| G | Alberta Government Buildings |
| M | Macdonald Hotel              |
| A | Chateau Lacombe Hotel        |



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 57









# CONSULTANTS- GEOLOGICAL, GEOPHYSICAL, ENGINEERING, LAND, SURVEYING

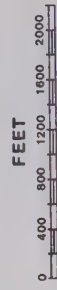
## DATA PROCESSORS 1964-65

### CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

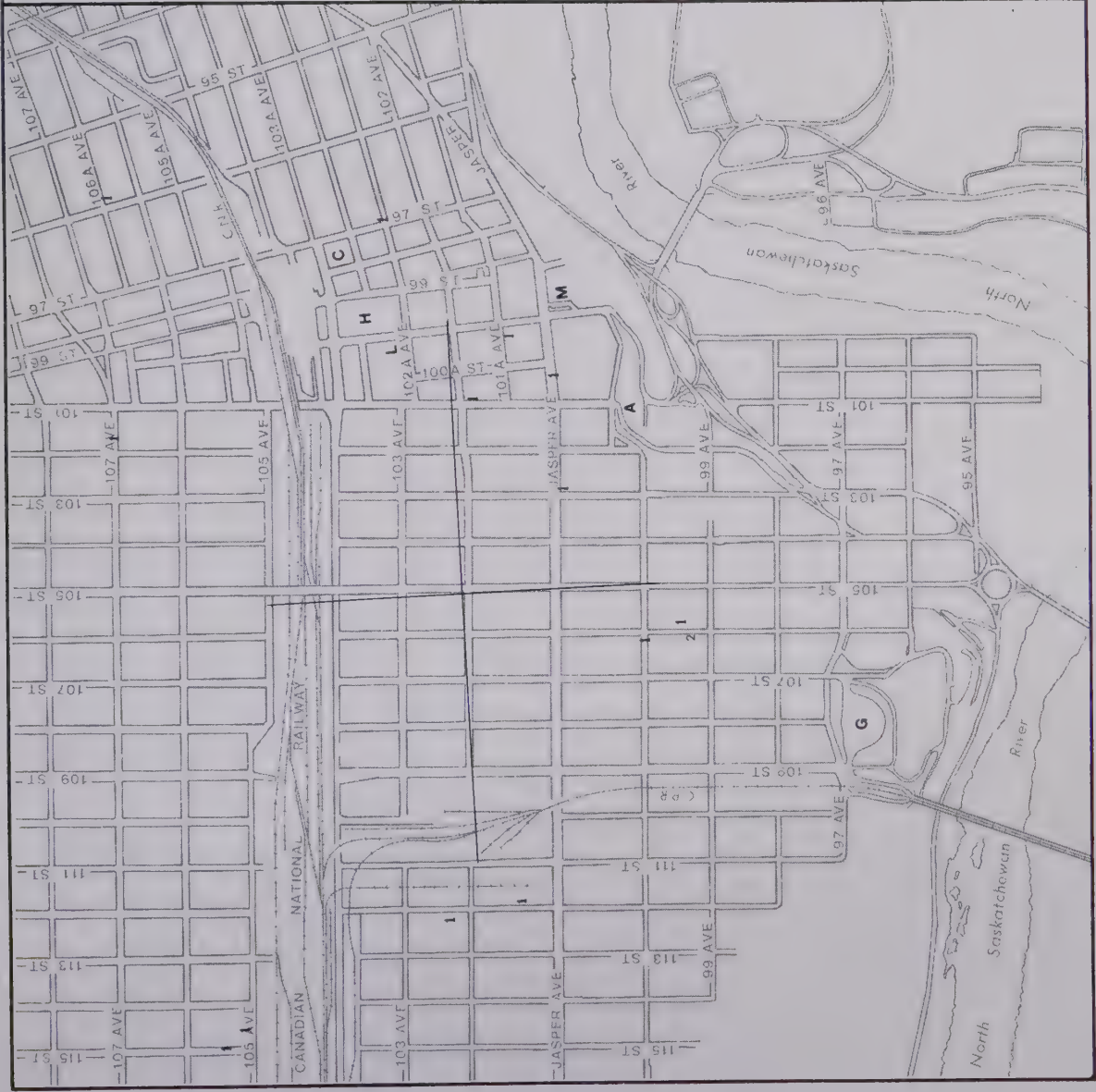
— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 59







**CONSULTANTS-  
GEOLOGICAL, GEOPHYSICAL,  
ENGINEERING,  
LAND, SURVEYING**

**DATA PROCESSORS  
1969-70**

**EDMONTON  
CENTRAL AREA EXCLUDED**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 60



# CONSULTANTS- GEOLOGICAL, GEOPHYSICAL, ENGINEERING, LAND, SURVEYING

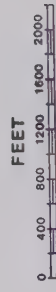
## DATA PROCESSORS 1969-70

### CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 61



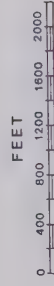
**CONSULTANTS-  
GEOLOGICAL, GEOPHYSICAL,  
ENGINEERING,  
LAND, SURVEYING**

**DATA PROCESSORS**

**CENTRAL EDMONTON**

**STANDARD DISTANCE  
PARAMETER**

1	1950-51
2	1954-55
3	1959-60
4	1964-65
5	1969-70



G. H. Z.

Figure 62





# FINANCIAL AND INVESTMENT

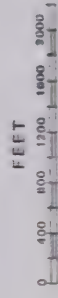
1950-51

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

—+— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 63













# FINANCIAL AND INVESTMENT 1959-60 CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 66







# FINANCIAL AND INVESTMENT 1964-65

**EDMONTON**  
**CENTRAL AREA EXCLUDED**

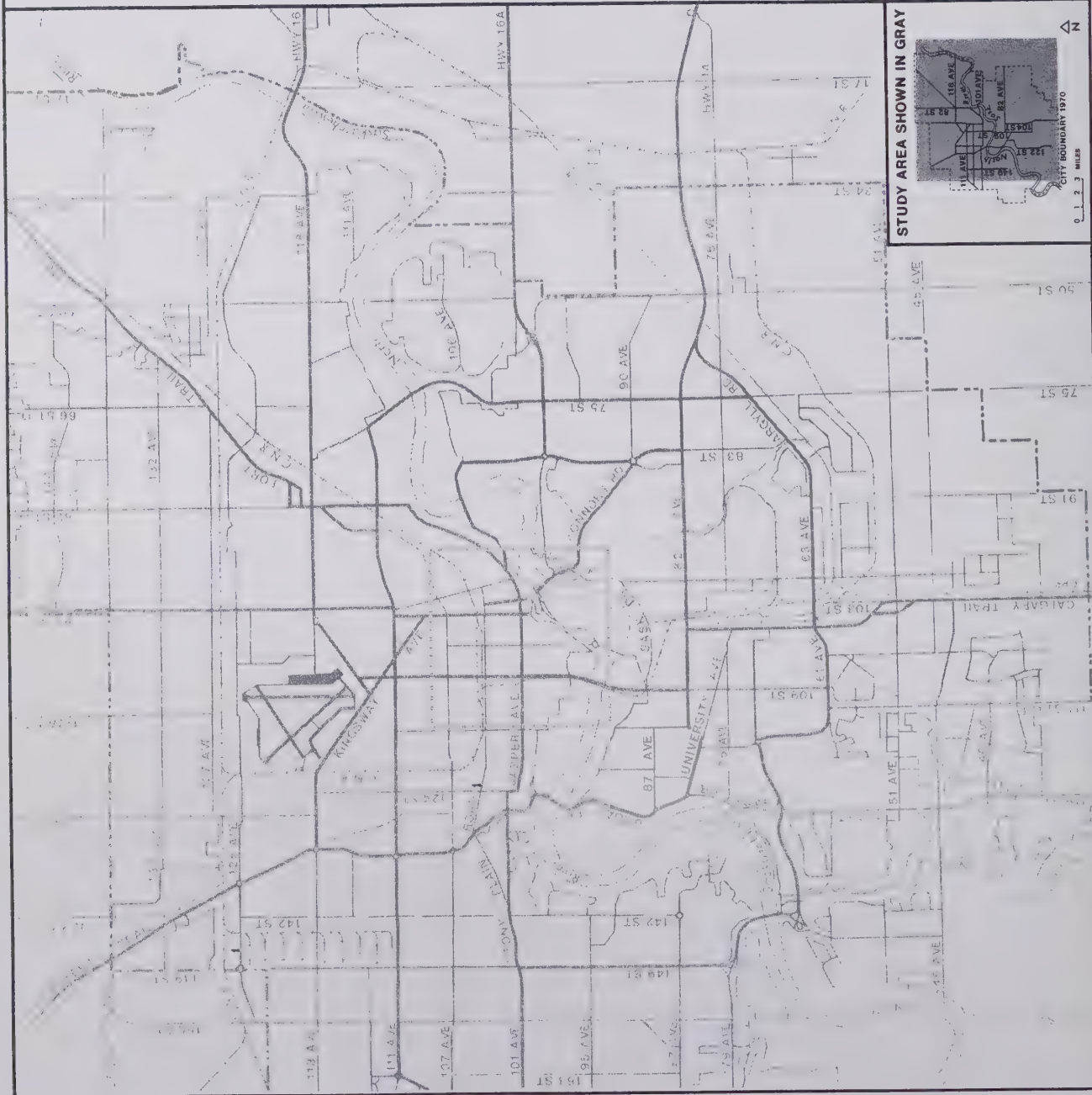
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 67

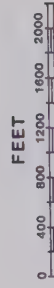


# FINANCIAL AND INVESTMENT 1964-65 CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

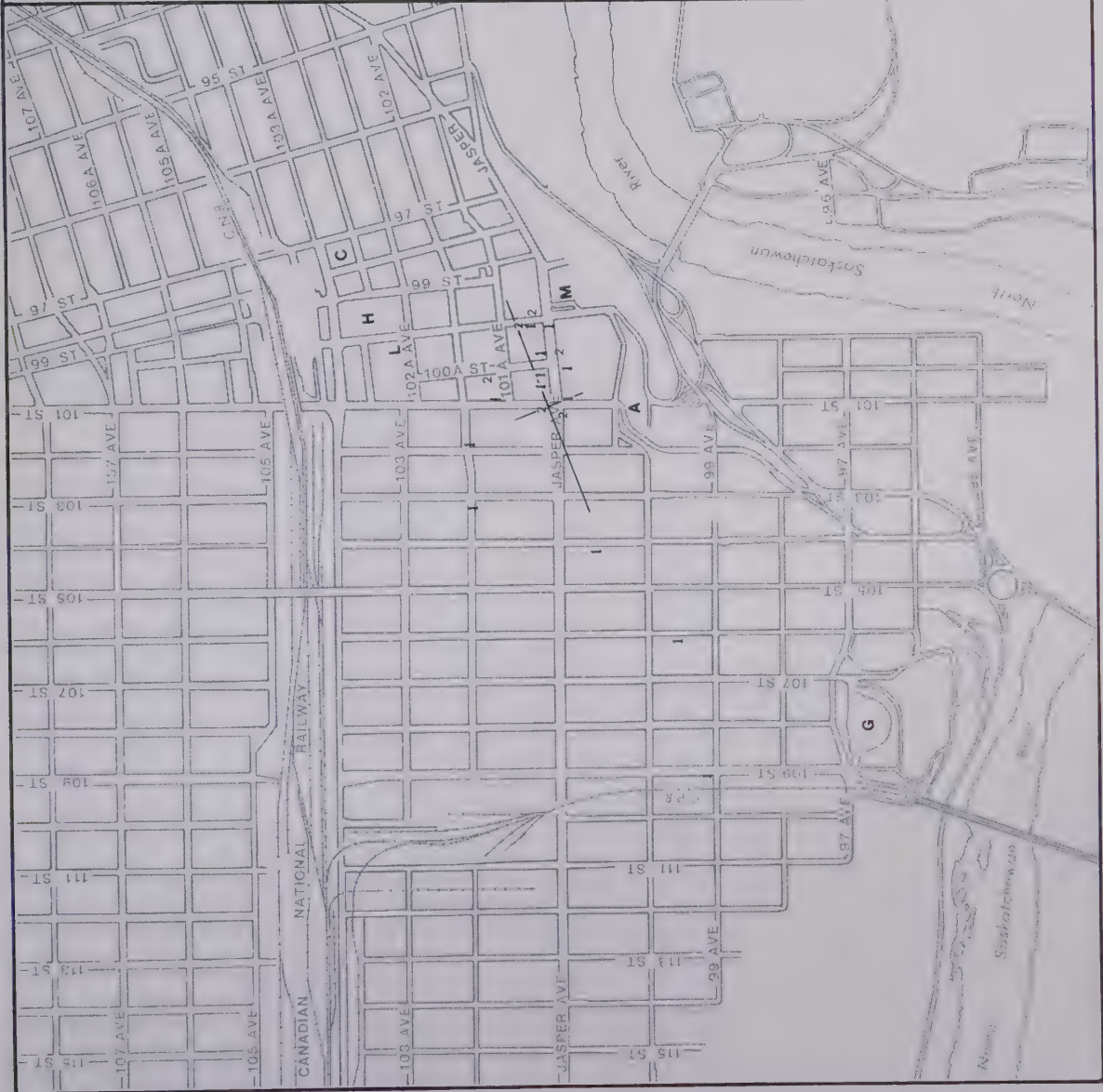
— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 68





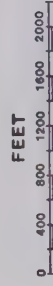
# FINANCIAL AND INVESTMENT 1969-70

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 69





# FINANCIAL AND INVESTMENT CENTRAL EDMONTON

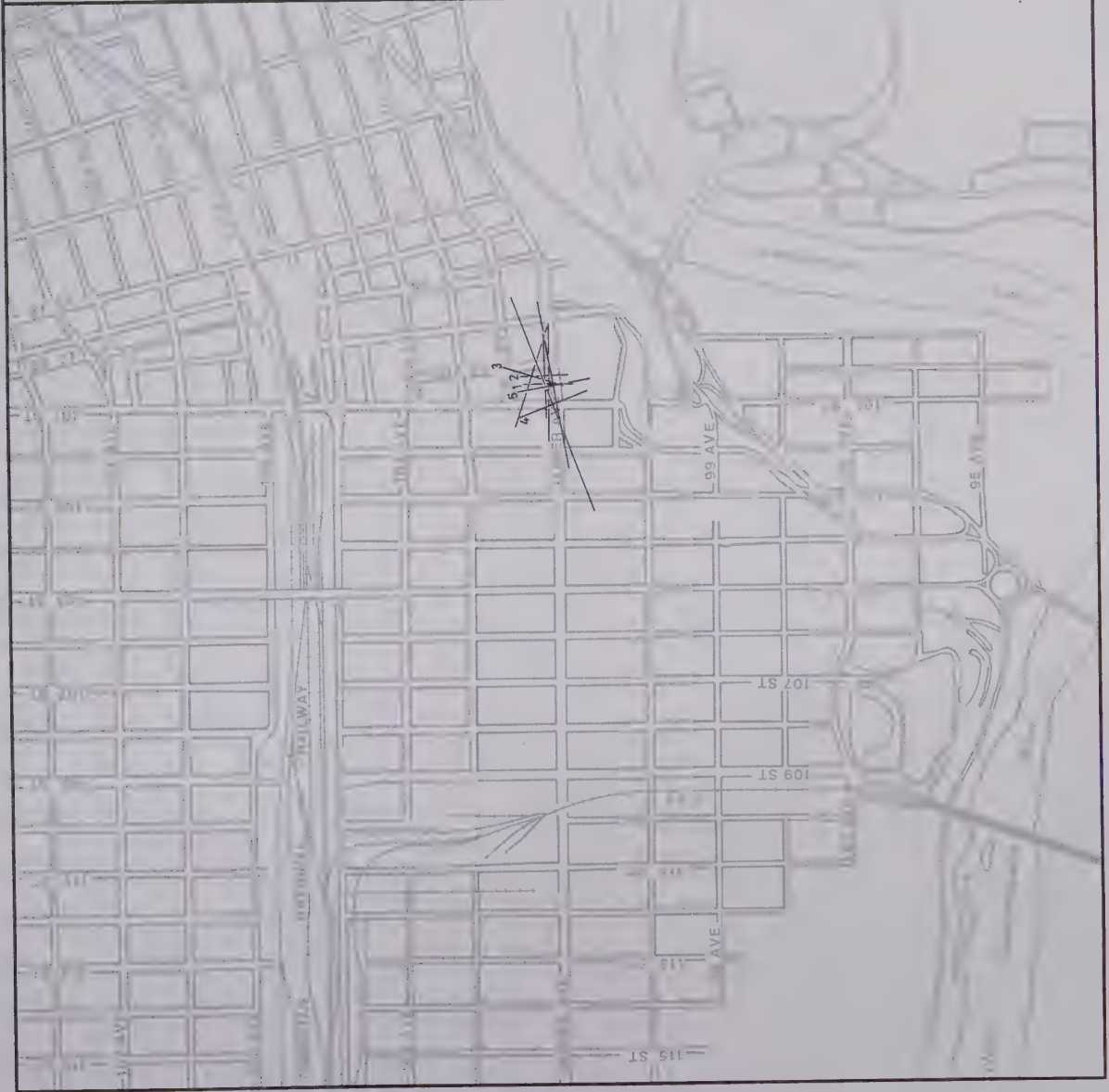
## STANDARD DISTANCE PARAMETER

1	1950-51
2	1954-55
3	1959-60
4	1964-65
5	1969-70



G. H. Z.

Figure 70







# LEASE BROKERS, LAND AGENTS 1950-51

EDMONTON  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 71



# LEASE BROKERS, LAND AGENTS

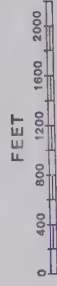
1950-51

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 72







# LEASE BROKERS, LAND AGENTS 1954-55

EDMONTON  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

————— CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 73



# LEASE BROKERS, LAND AGENTS

1954-55

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

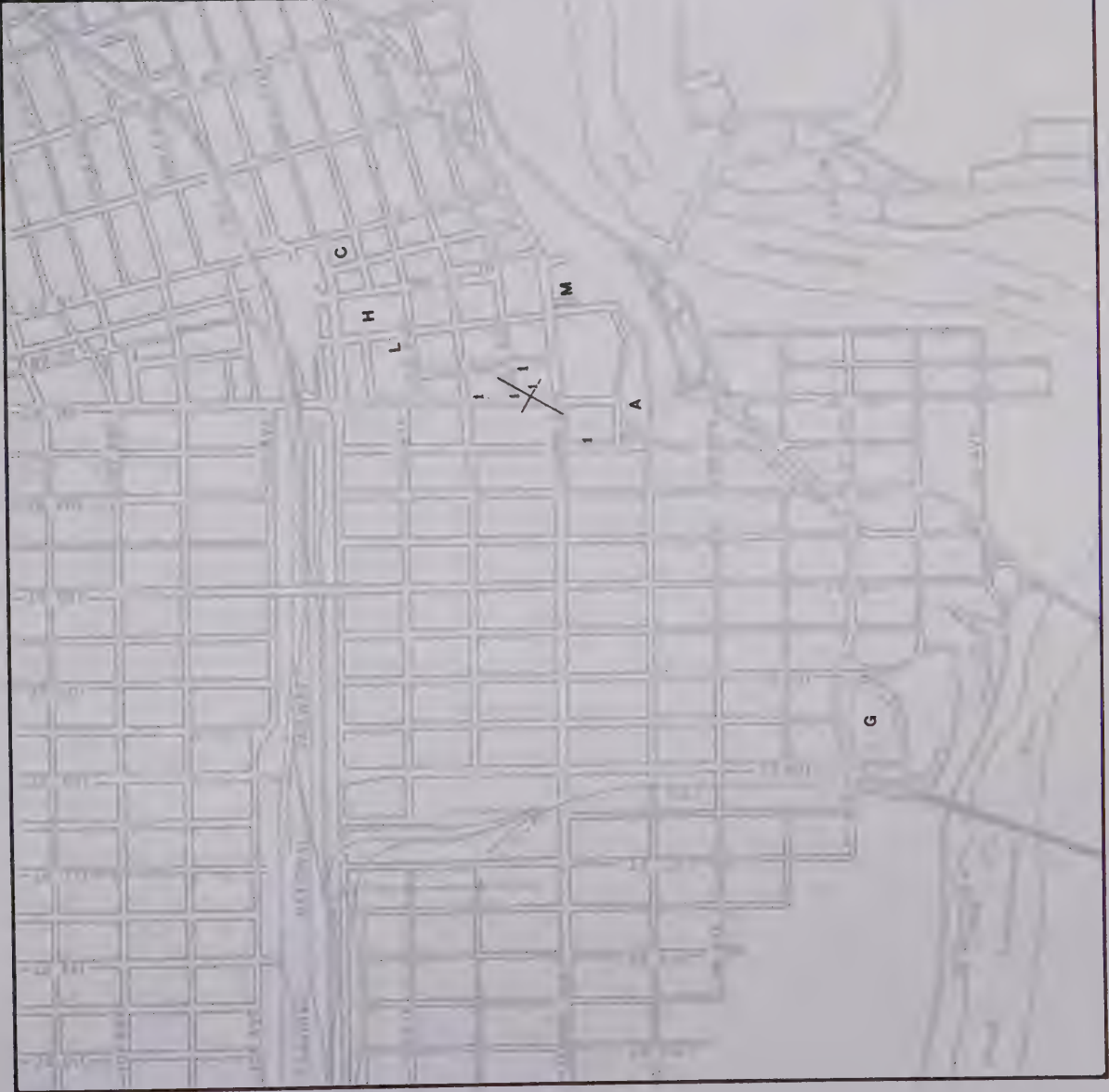
— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 74







**LEASE BROKERS,  
LAND AGENTS  
1959-60**

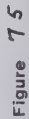
**EDMONTON  
CENTRAL AREA EXCLUDED**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

## CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.



# LEASE BROKERS, LAND AGENTS

1959-60

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 76







# LEASE BROKERS, LAND AGENTS

1964-65

## EDMONTON CENTRAL AREA EXCLUDED

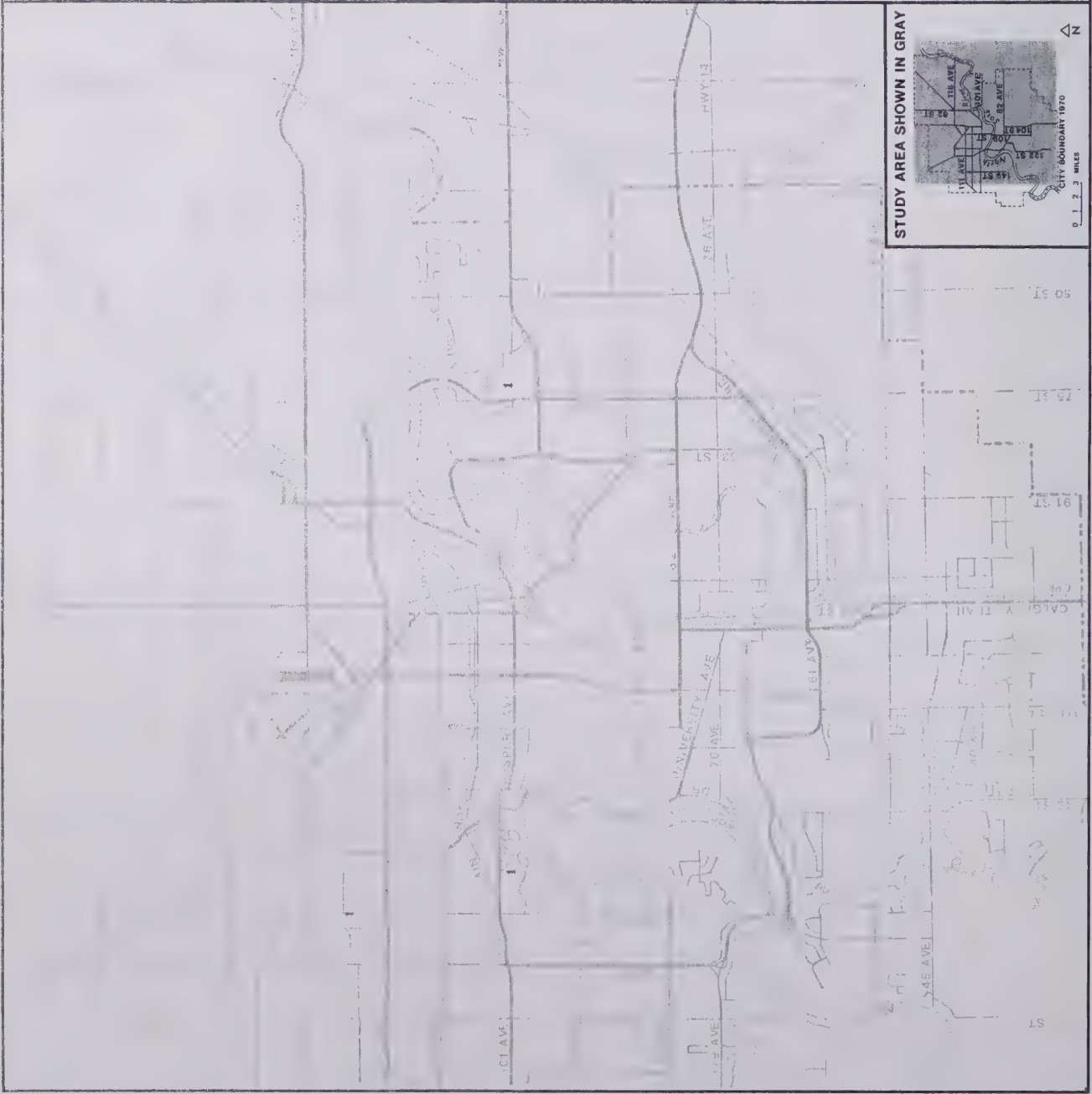
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

— CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 77



**LEASE BROKERS,  
LAND AGENTS  
1964-65**

**CENTRAL EDMONTON**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

PARAMETER	STANDARD DISTANCE
1. $\mu$	0.0000
2. $\sigma$	0.0000
3. $\mu$	0.0000
4. $\sigma$	0.0000
5. $\mu$	0.0000
6. $\sigma$	0.0000
7. $\mu$	0.0000
8. $\sigma$	0.0000
9. $\mu$	0.0000
10. $\sigma$	0.0000
11. $\mu$	0.0000
12. $\sigma$	0.0000
13. $\mu$	0.0000
14. $\sigma$	0.0000
15. $\mu$	0.0000
16. $\sigma$	0.0000
17. $\mu$	0.0000
18. $\sigma$	0.0000
19. $\mu$	0.0000
20. $\sigma$	0.0000
21. $\mu$	0.0000
22. $\sigma$	0.0000
23. $\mu$	0.0000
24. $\sigma$	0.0000
25. $\mu$	0.0000
26. $\sigma$	0.0000
27. $\mu$	0.0000
28. $\sigma$	0.0000
29. $\mu$	0.0000
30. $\sigma$	0.0000
31. $\mu$	0.0000
32. $\sigma$	0.0000
33. $\mu$	0.0000
34. $\sigma$	0.0000
35. $\mu$	0.0000
36. $\sigma$	0.0000
37. $\mu$	0.0000
38. $\sigma$	0.0000
39. $\mu$	0.0000
40. $\sigma$	0.0000
41. $\mu$	0.0000
42. $\sigma$	0.0000
43. $\mu$	0.0000
44. $\sigma$	0.0000
45. $\mu$	0.0000
46. $\sigma$	0.0000
47. $\mu$	0.0000
48. $\sigma$	0.0000
49. $\mu$	0.0000
50. $\sigma$	0.0000
51. $\mu$	0.0000
52. $\sigma$	0.0000
53. $\mu$	0.0000
54. $\sigma$	0.0000
55. $\mu$	0.0000
56. $\sigma$	0.0000
57. $\mu$	0.0000
58. $\sigma$	0.0000
59. $\mu$	0.0000
60. $\sigma$	0.0000
61. $\mu$	0.0000
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63. $\mu$	0.0000
64. $\sigma$	0.0000
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66. $\sigma$	0.0000
67. $\mu$	0.0000
68. $\sigma$	0.0000
69. $\mu$	0.0000
70. $\sigma$	0.0000
71. $\mu$	0.0000
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73. $\mu$	0.0000
74. $\sigma$	0.0000
75. $\mu$	0.0000
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77. $\mu$	0.0000
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79. $\mu$	0.0000
80. $\sigma$	0.0000
81. $\mu$	0.0000
82. $\sigma$	0.0000
83. $\mu$	0.0000
84. $\sigma$	0.0000
85. $\mu$	0.0000
86. $\sigma$	0.0000
87. $\mu$	0.0000
88. $\sigma$	0.0000
89. $\mu$	0.0000
90. $\sigma$	0.0000
91. $\mu$	0.0000
92. $\sigma$	0.0000
93. $\mu$	0.0000
94. $\sigma$	0.0000
95. $\mu$	0.0000
96. $\sigma$	0.0000
97. $\mu$	0.0000
98. $\sigma$	0.0000
99. $\mu$	0.0000
100. $\sigma$	0.0000

- H City Hall  
L Land Titles Office  
C Court House  
G Alberta Government Buildings  
M Macdonald Hotel  
A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

Figure 78







# LEASE BROKERS, LAND AGENTS

1969-70

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

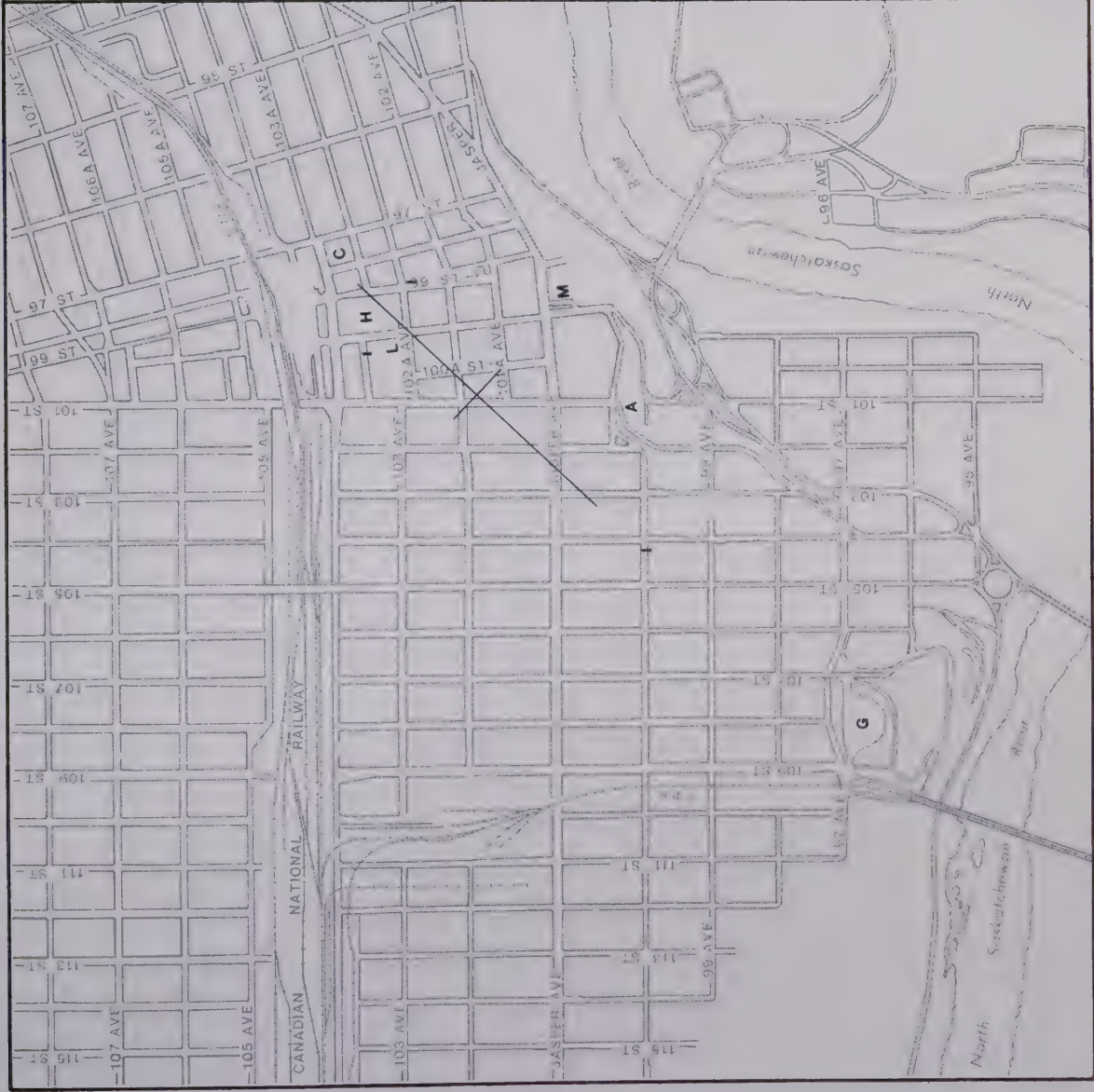
— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 8 0





LEASE BROKERS,  
LAND AGENTS

CENTRAL EDMONTON

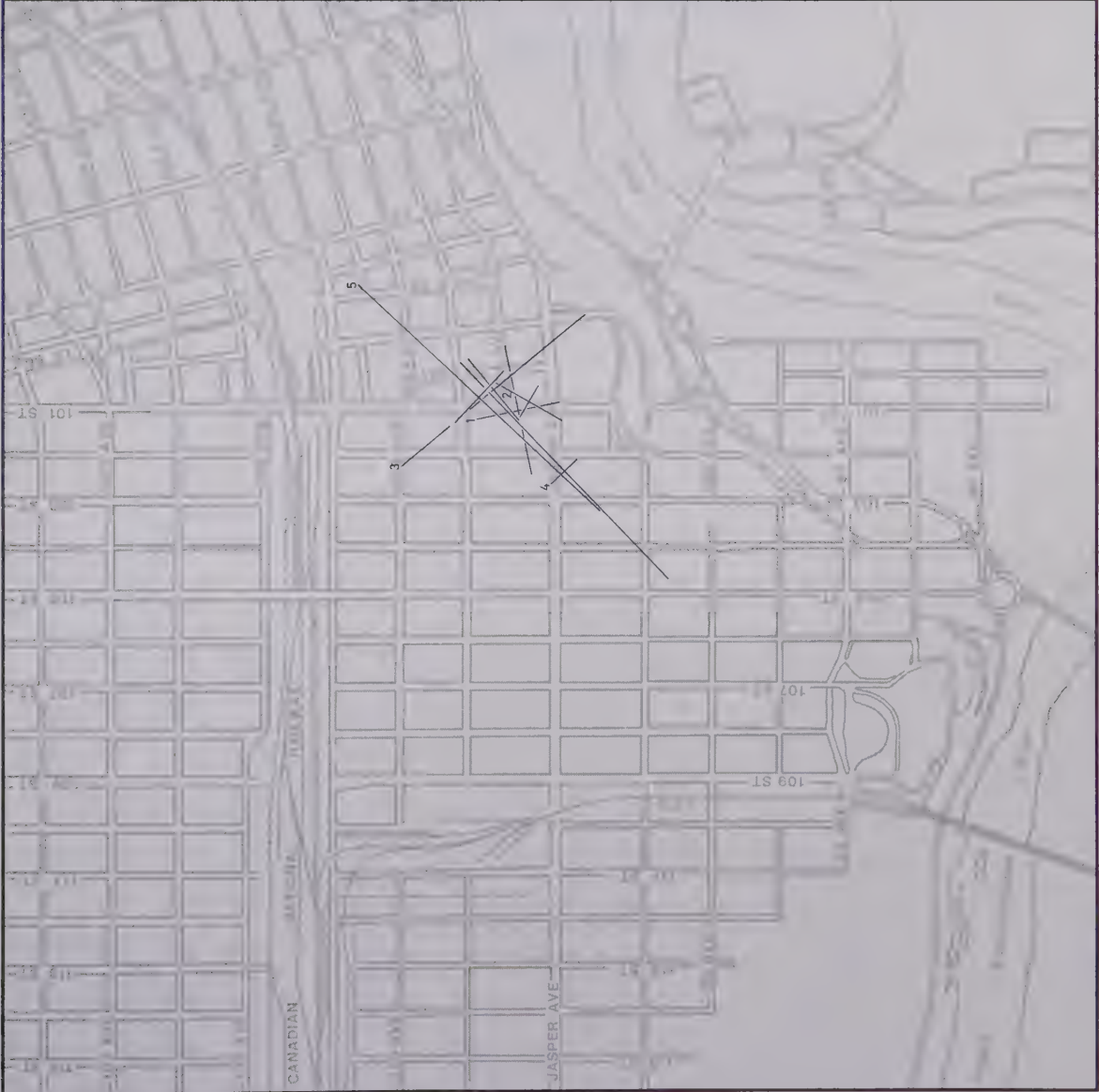
STANDARD DISTANCE  
PARAMETER

1	1950-51
2	1954-55
3	1959-60
4	1964-65
5	1969-70



G. H. Z.

Figure 81





OIL OPERATIONS OFFICES,  
CALGARY





# SERVICE AND SUPPLY 1950-51

## CALGARY CENTRAL AREA EXCLUDED

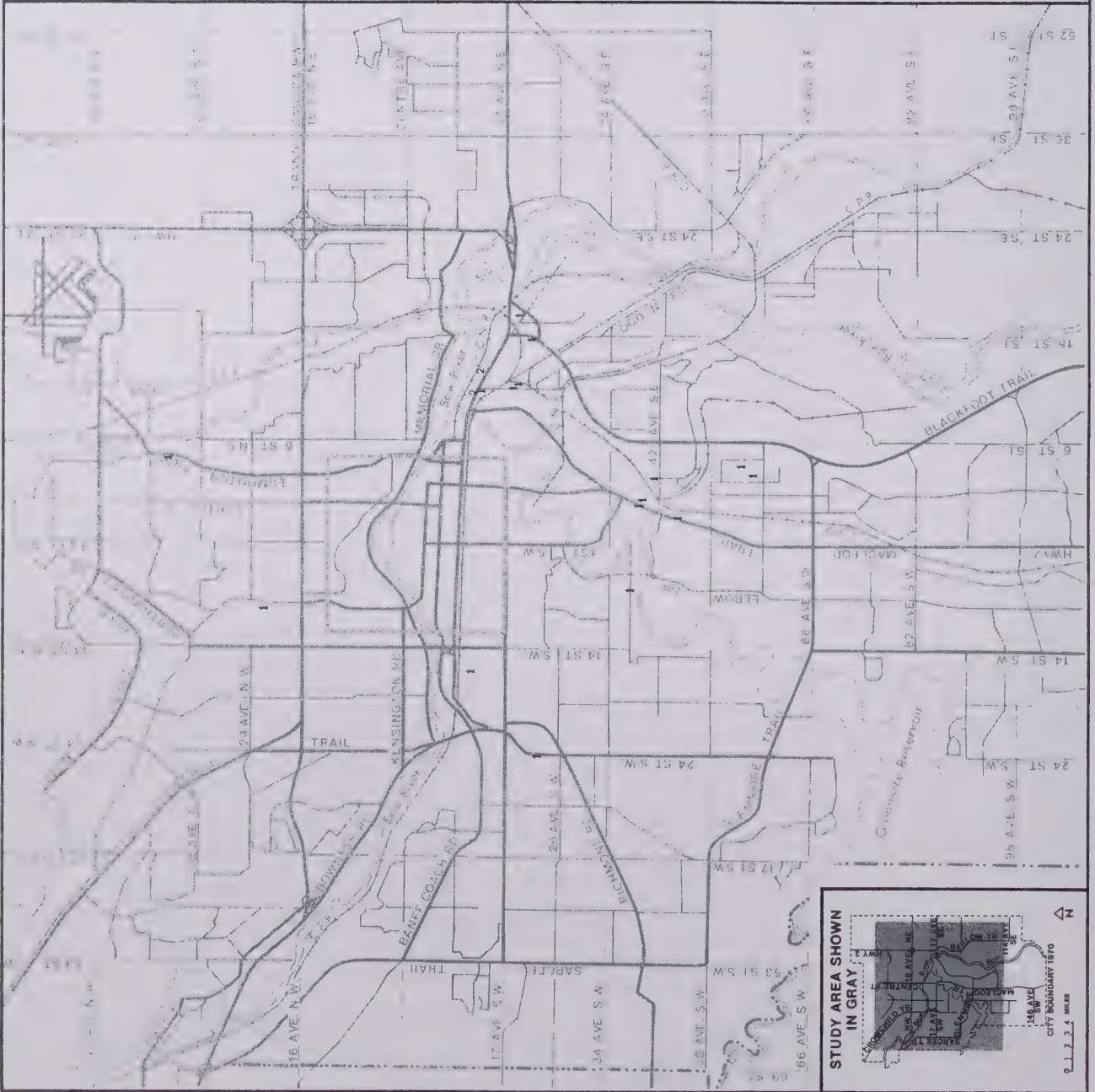
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE: NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 82



# SERVICE AND SUPPLY

1950-51

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 8 3







# SERVICE AND SUPPLY 1954-55

## CALGARY CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 84



# SERVICE AND SUPPLY

1954-55

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 8 5







# SERVICE AND SUPPLY 1959-60

CALGARY  
CENTRAL AREA EXCLUDED

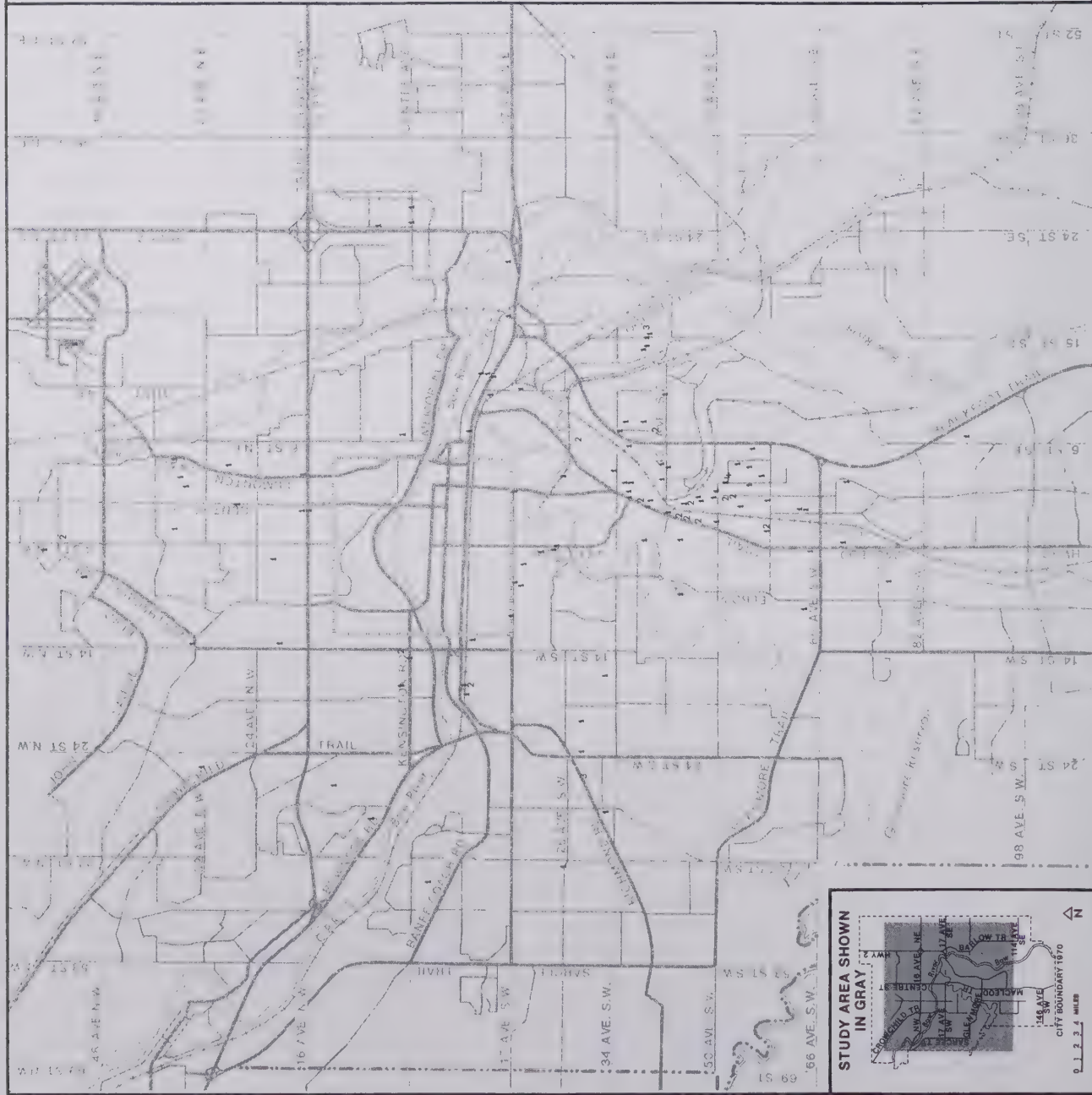
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 86



# SERVICE AND SUPPLY 1959-60

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

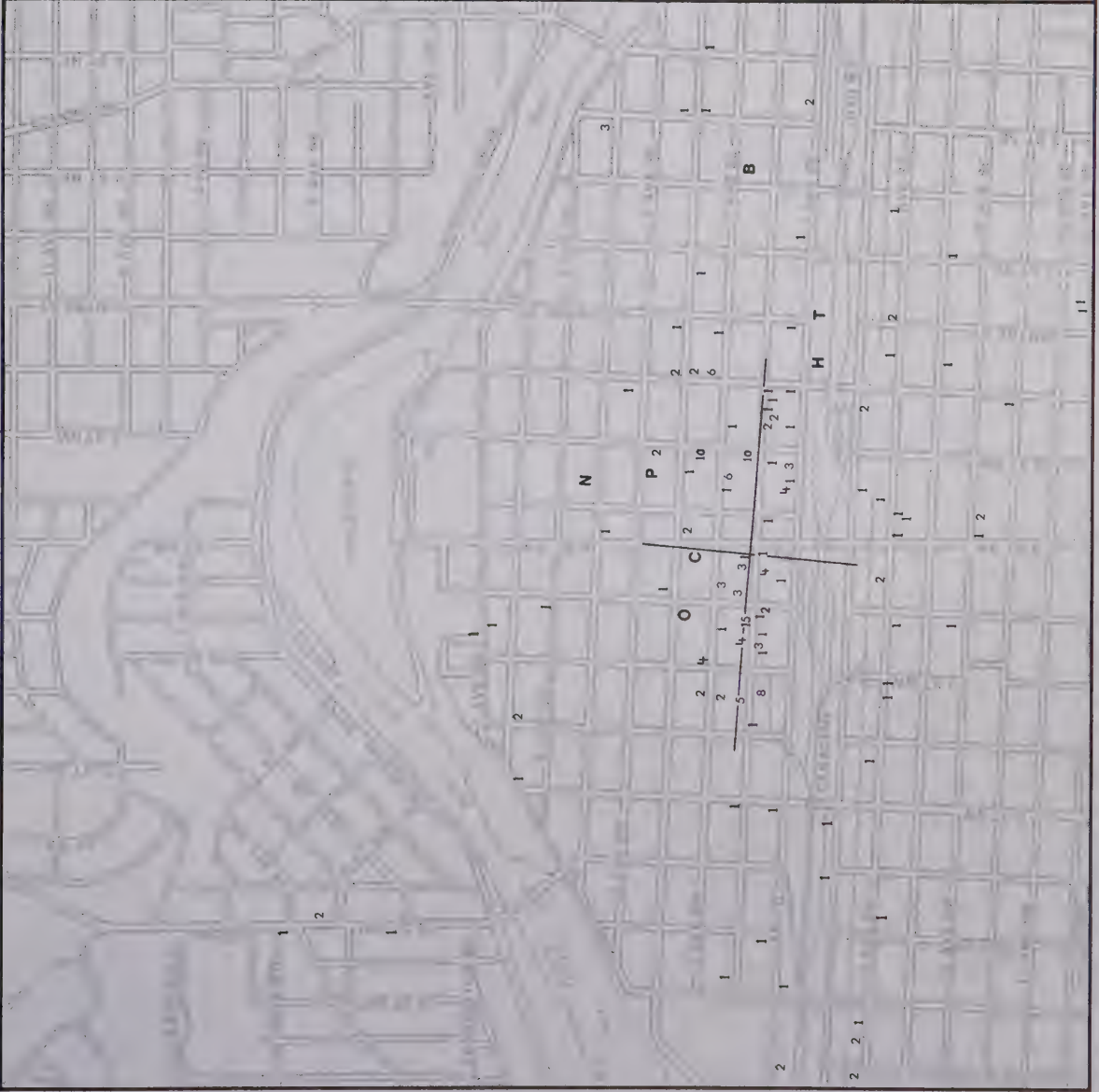
— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 87







**SERVICE  
AND SUPPLY  
1964-65**

**CALGARY**  
**CENTRAL AREA EXCLUDED**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 88

# SERVICE AND SUPPLY

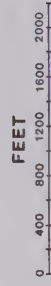
1964-65

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 89







# SERVICE AND SUPPLY 1969-70

## CALGARY CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

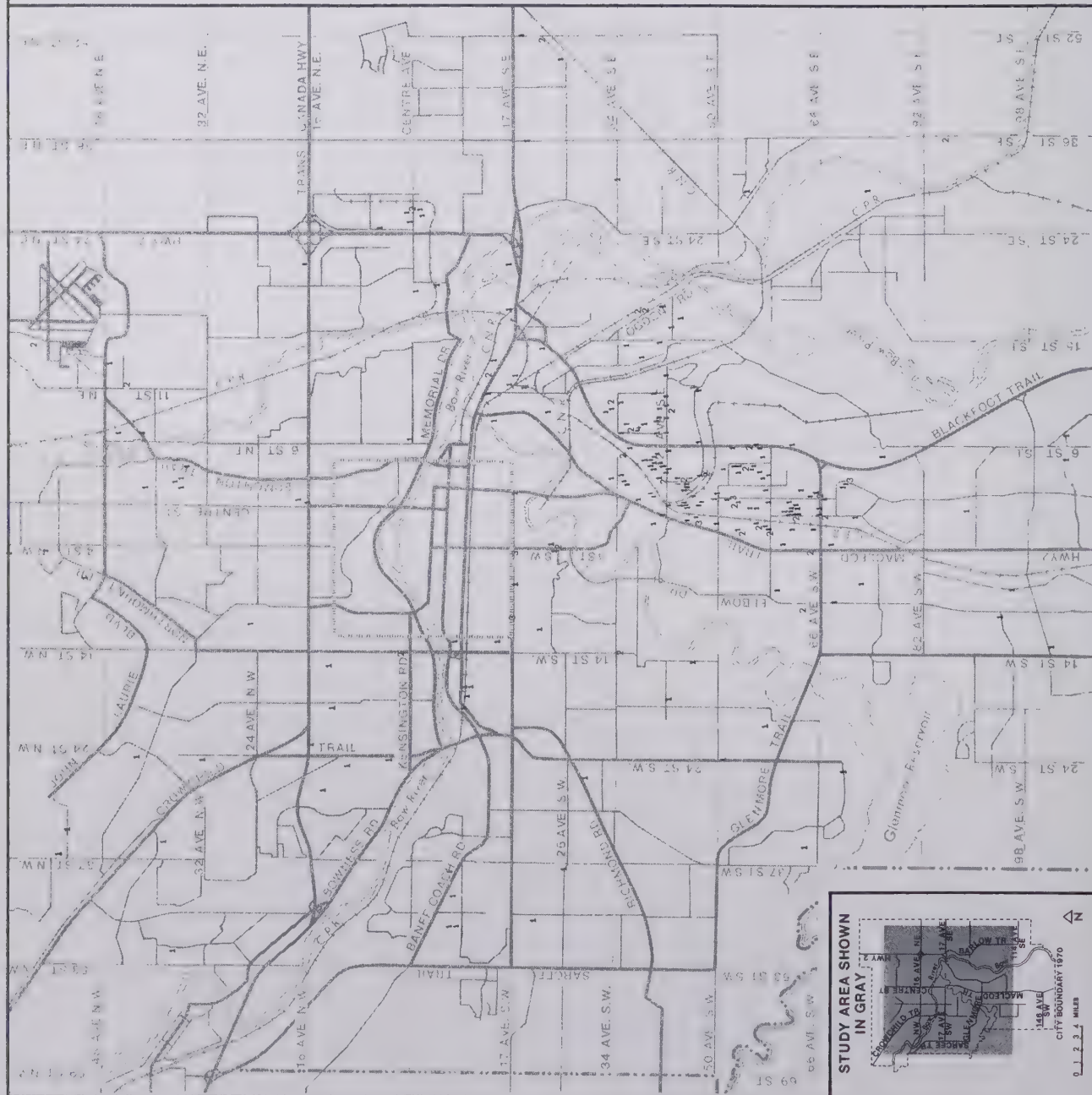
CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 90



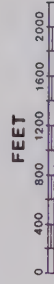
# SERVICE AND SUPPLY 1969-70

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

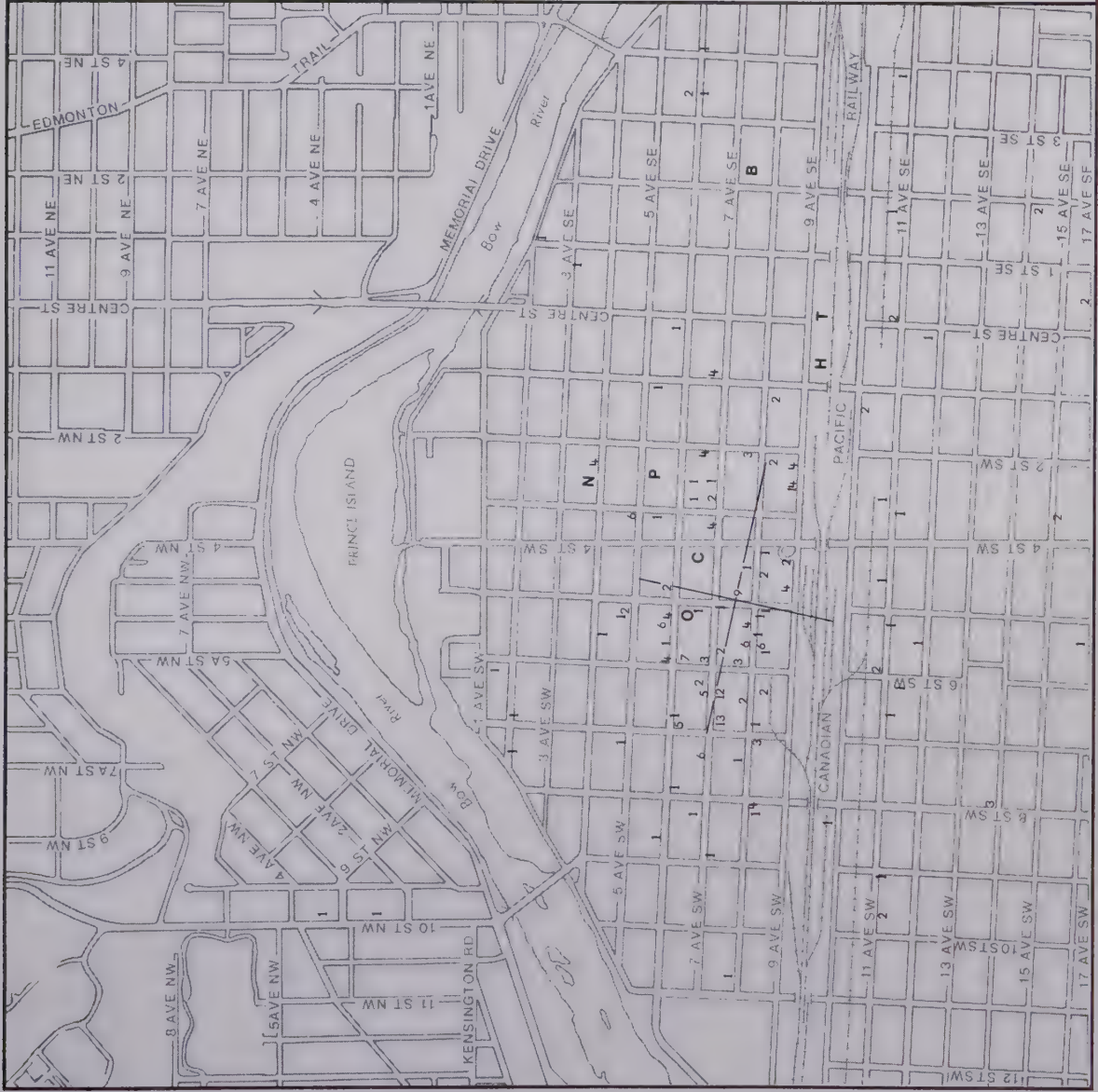
— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 91



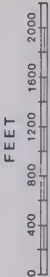


SERVICE  
AND SUPPLY

CENTRAL CALGARY

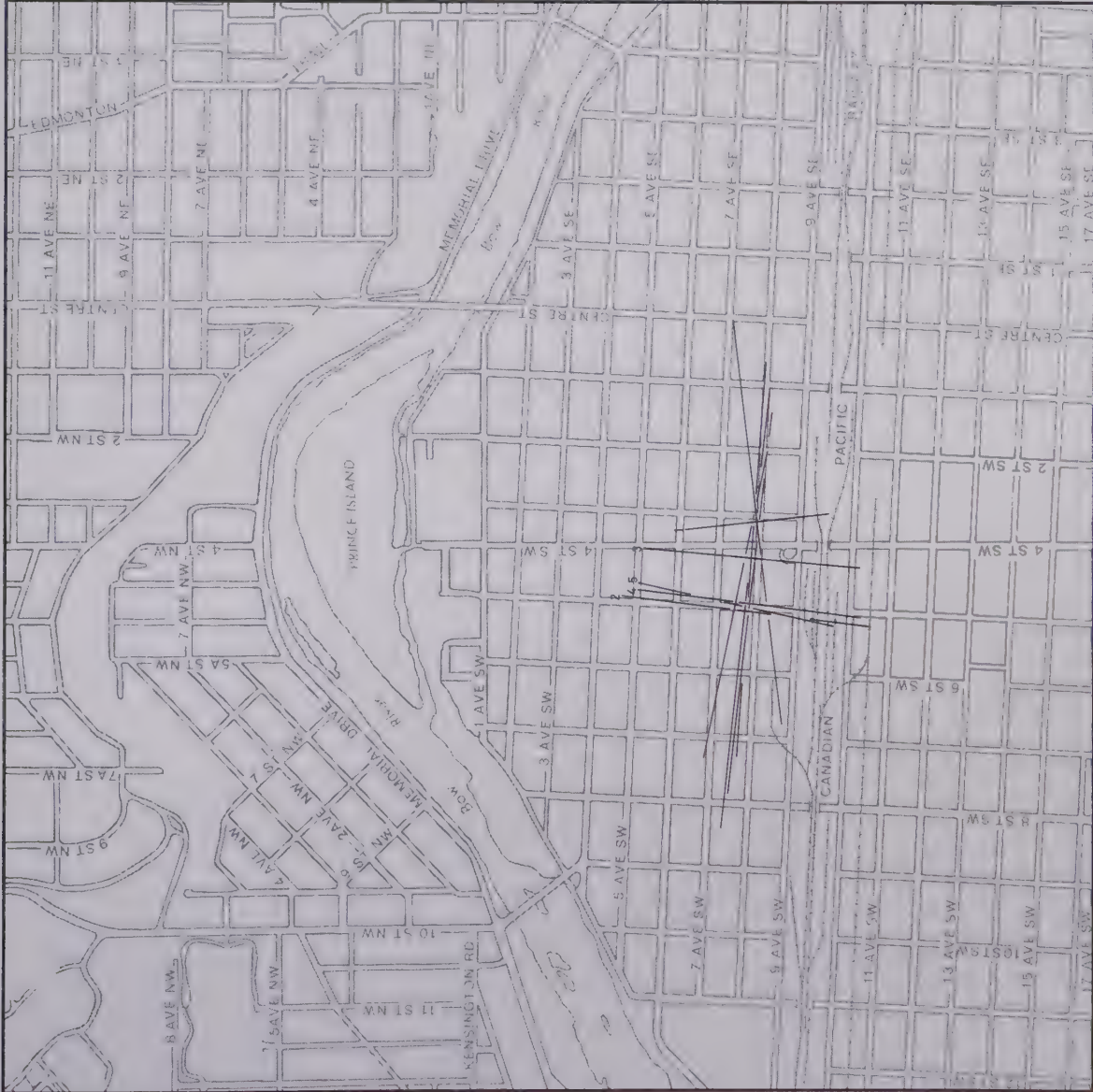
STANDARD DISTANCE  
PARAMETER

- 1 1950-51
- 2 1954-55
- 3 1959-60
- 4 1964-65
- 5 1969-70



G. H. Z.

Figure 92





# OILWELL DRILLING CONTRACTORS

1950-51

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 43







# OILWELL DRILLING CONTRACTORS 1954-55

CALGARY  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 9 4



# OILWELL DRILLING CONTRACTORS 1954-55

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

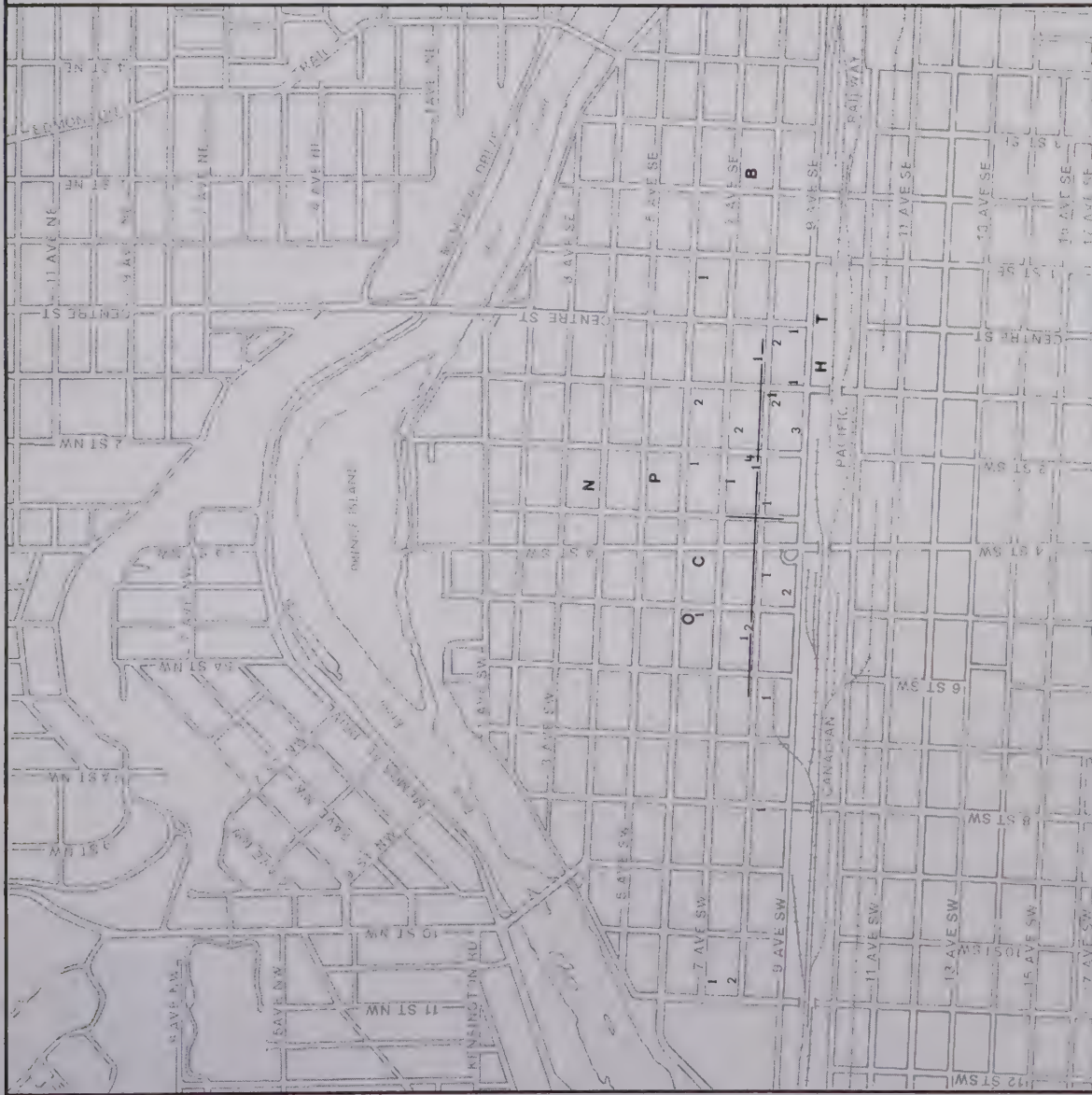
— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 95







# OILWELL DRILLING CONTRACTORS 1959-60

CALGARY  
CENTRAL AREA EXCLUDED

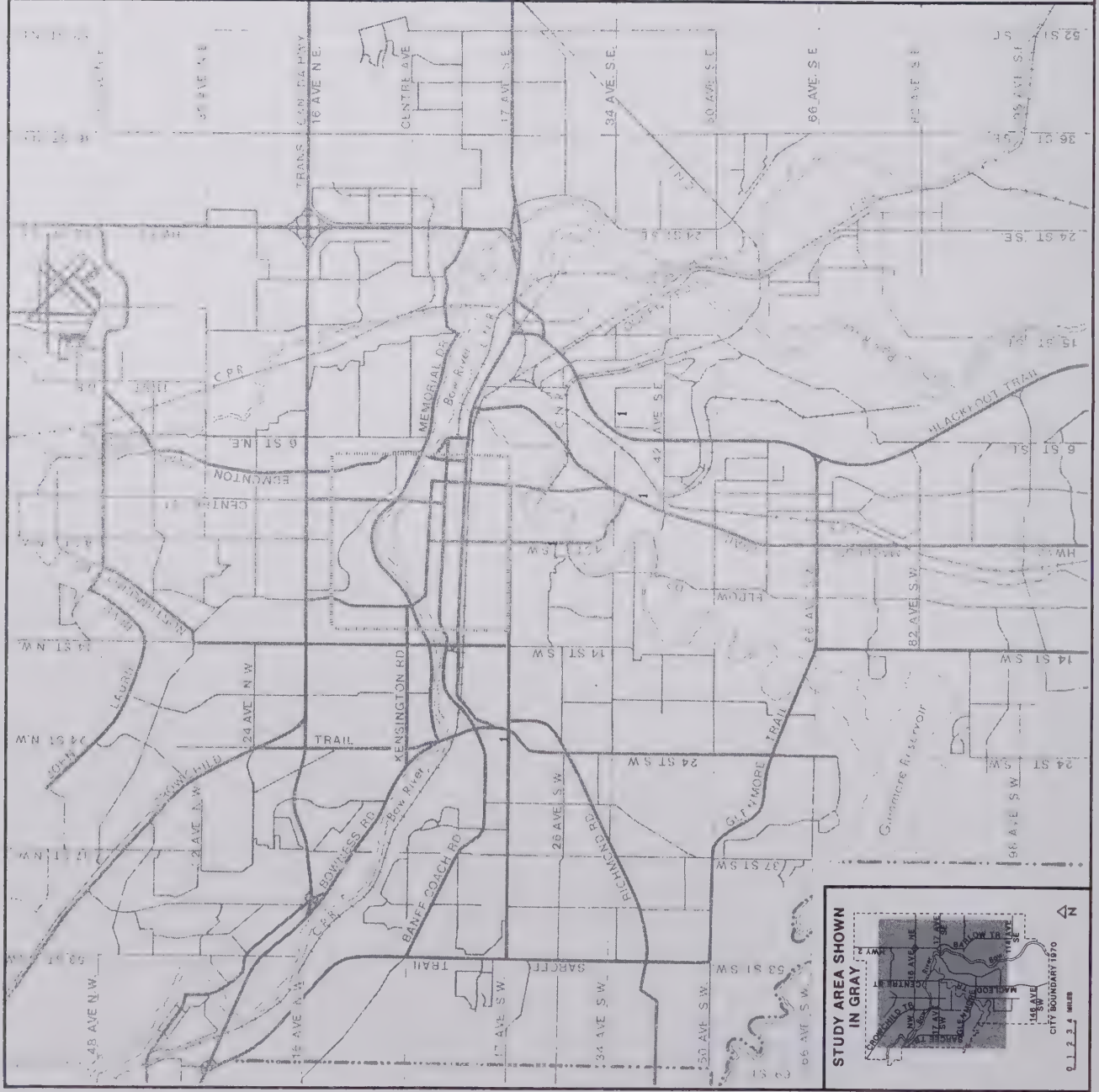
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 96



- 







# OILWELL DRILLING CONTRACTORS

1964-65

CALGARY  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 98



# OILWELL DRILLING CONTRACTORS

1964-65

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

—+—	STANDARD DISTANCE PARAMETER
O	Oil and Gas Conservation Board
P	Petroleum Club
N	Calgary Inn
H	Palliser Hotel
C	Court House, Land Titles Office
T	Husky Tower
B	City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 99







# OILWELL DRILLING CONTRACTORS

1969-70

CALGARY  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 100



# OILWELL DRILLING CONTRACTORS 1969-70

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

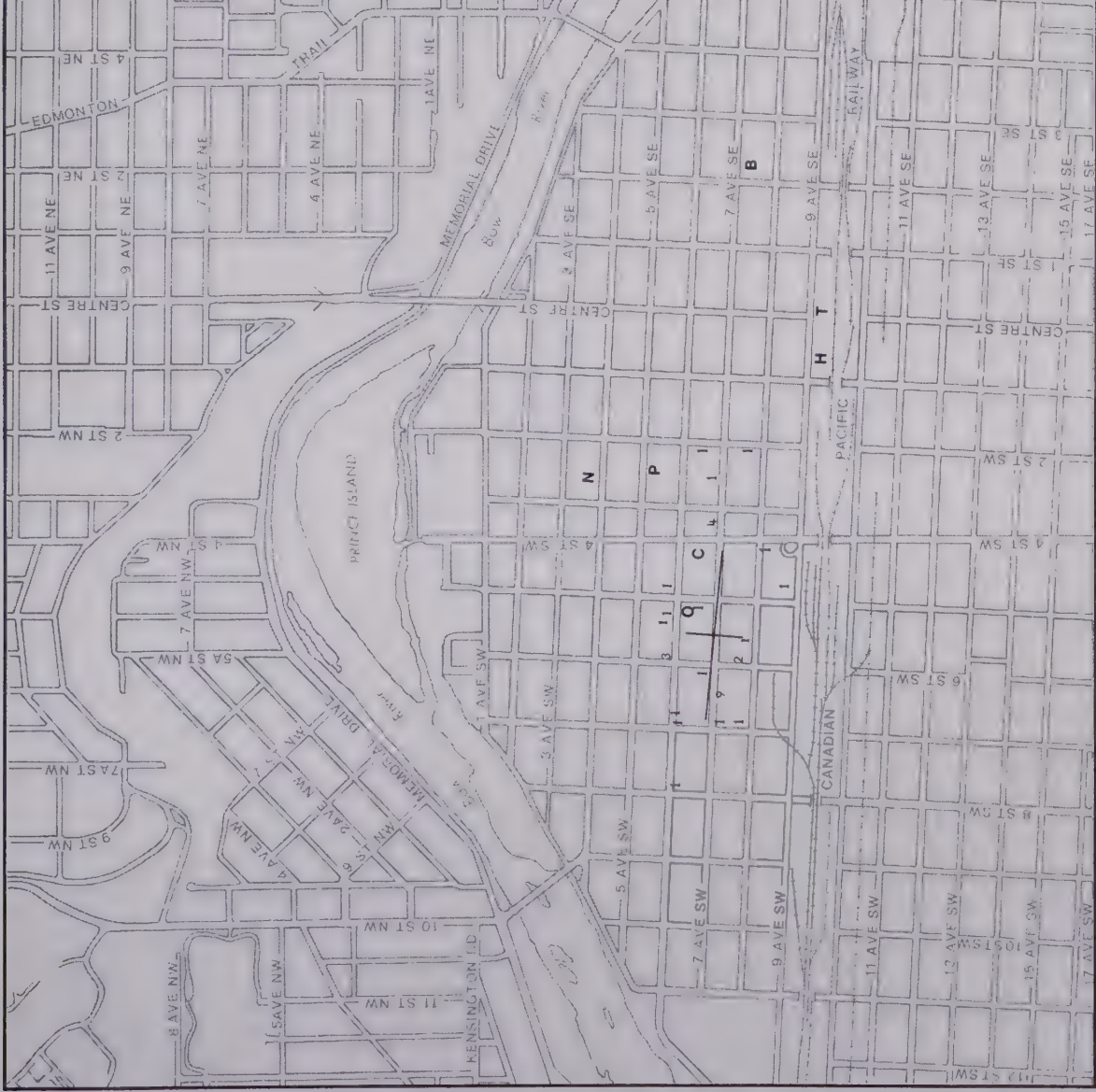
- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 101





# OILWELL DRILLING CONTRACTORS

## CENTRAL CALGARY

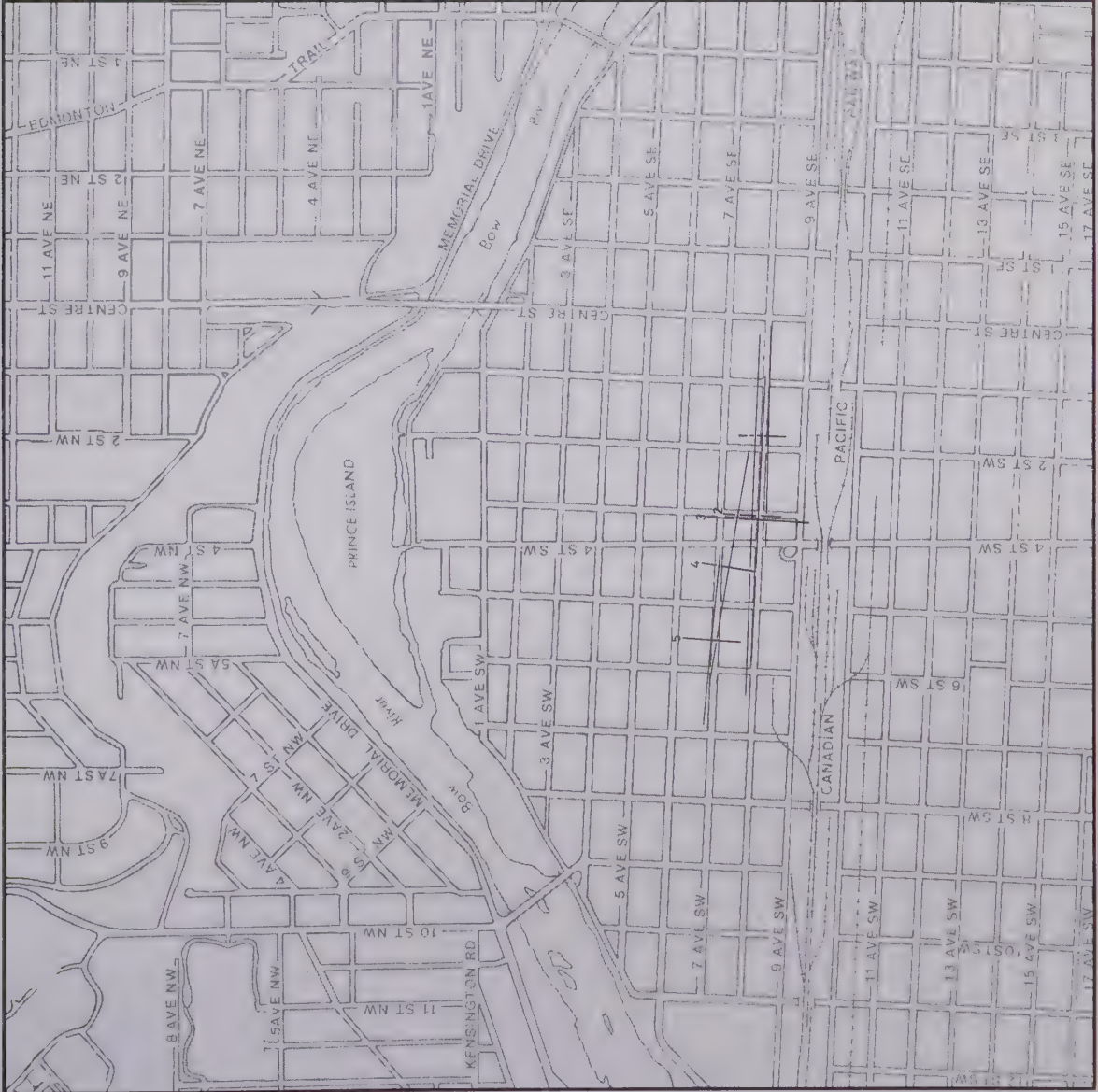
### STANDARD DISTANCE PARAMETER

- |   |         |
|---|---------|
| 1 | 1950-51 |
| 2 | 1954-55 |
| 3 | 1959-60 |
| 4 | 1964-65 |
| 5 | 1969-70 |



G. H. Z.

Figure 102







**CONSTRUCTORS,  
FABRICATORS**

1959-60

**CENTRAL AREA EXCLUDED**

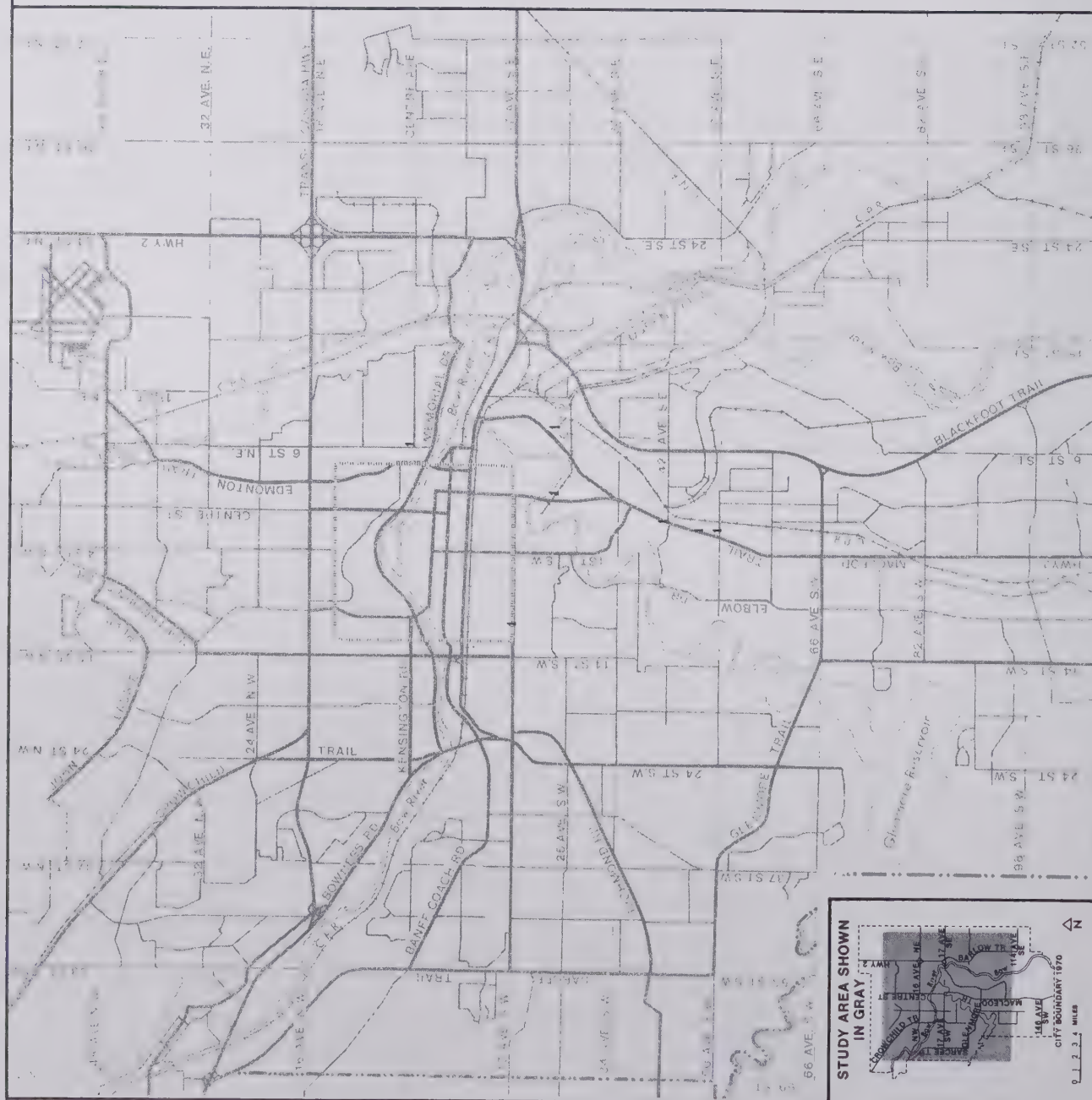
EACH ONE IS LESS THAN TEN.

CENTRAL AREA

SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 103



# ENGINEERS, DESIGNERS, CONSTRUCTORS, FABRICATORS

1959-60

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 104









# ENGINEERS, DESIGNERS, CONSTRUCTORS, FABRICATORS

1964-65

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

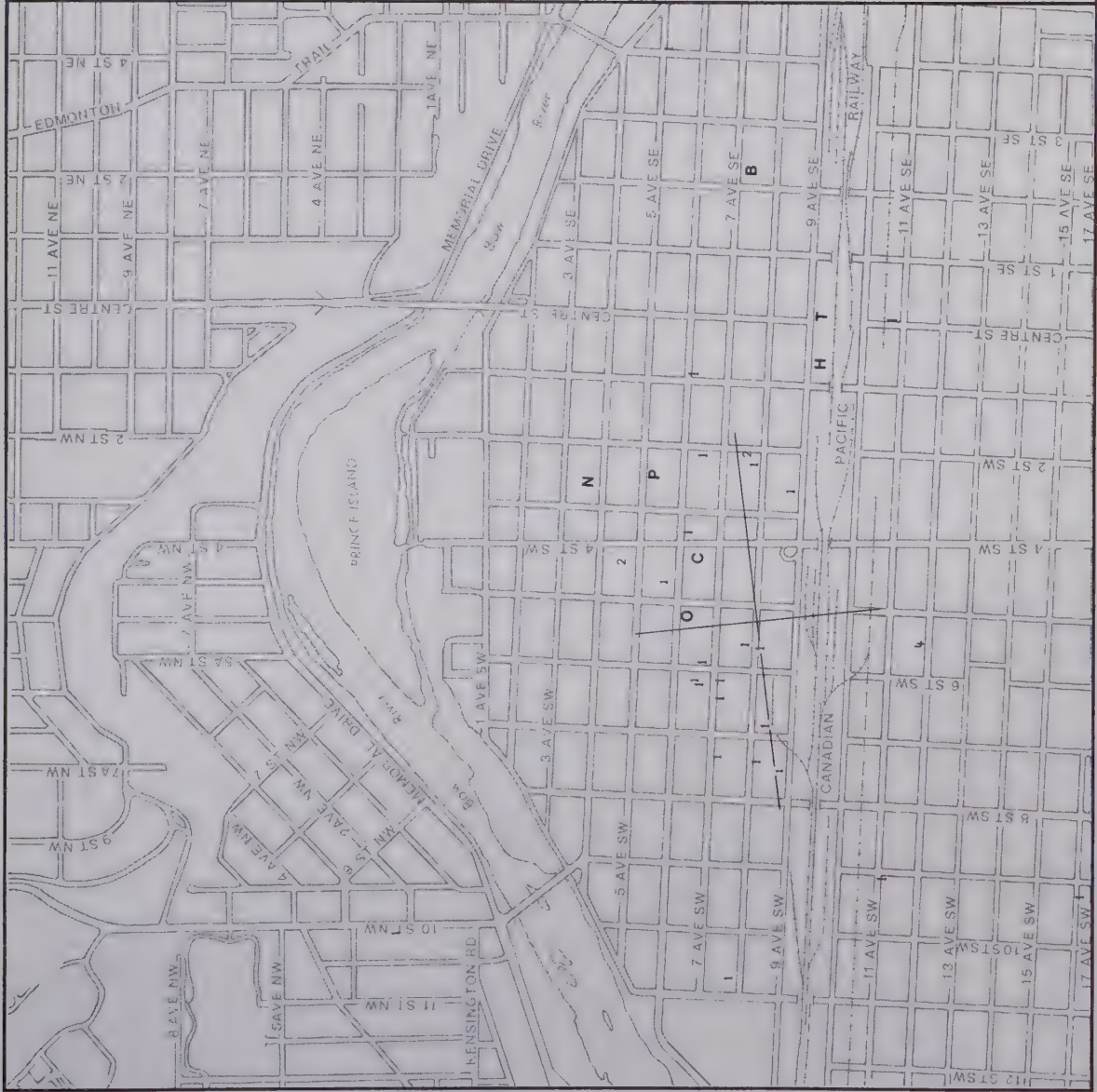
- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 106







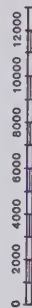
## 1969-70

**CALGARY**  
**CENTRAL AREA EXCLUDED**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

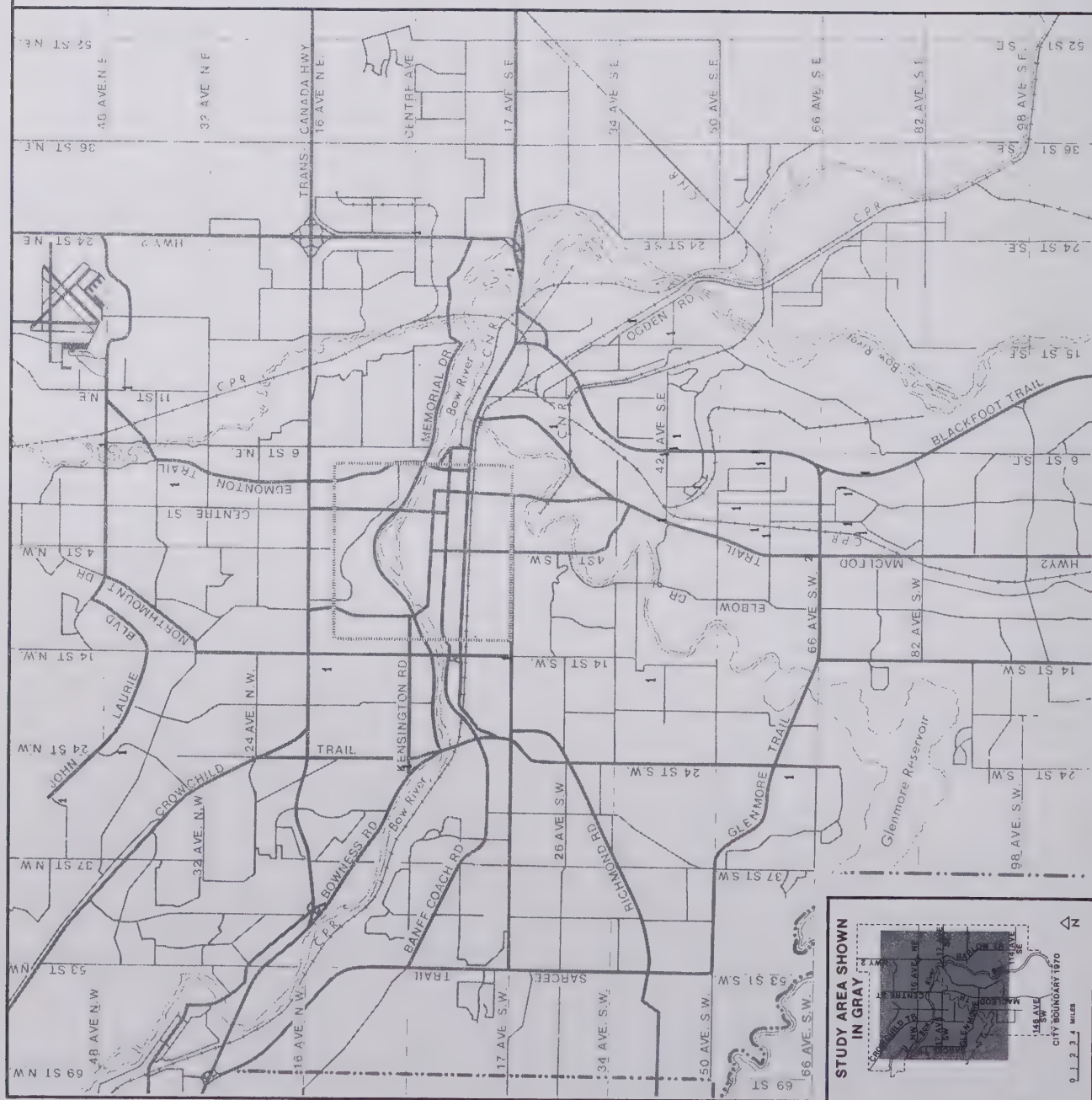
CENTRAL AREA

FEET



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 107



# ENGINEERS, DESIGNERS, CONSTRUCTORS, FABRICATORS

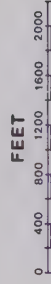
1969-70

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

—+— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House
- T Husky Tower
- B City Hall and Administration Building



SOURCE: NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 108

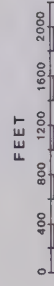




# ENGINEERS, DESIGNERS, CONSTRUCTORS, FABRICATORS CENTRAL CALGARY

## STANDARD DISTANCE PARAMETER

- |   |         |
|---|---------|
| 1 | 1950-51 |
| 2 | 1954-55 |
| 3 | 1959-60 |
| 4 | 1964-65 |
| 5 | 1969-70 |



G. H. Z.

Figure 109







**CALGARY**  
**CENTRAL AREA EXCLUDED**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA

A vertical scale bar labeled "FEET" with markings from 0 to 12,000 in increments of 2,000.

SOURCE : NICKLE'S CANADIAN OIL REGISTER

Figure 110

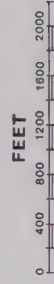
# GEOPHYSICAL AND EXPLORATION DRILLING CONTRACTORS 1950-51

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

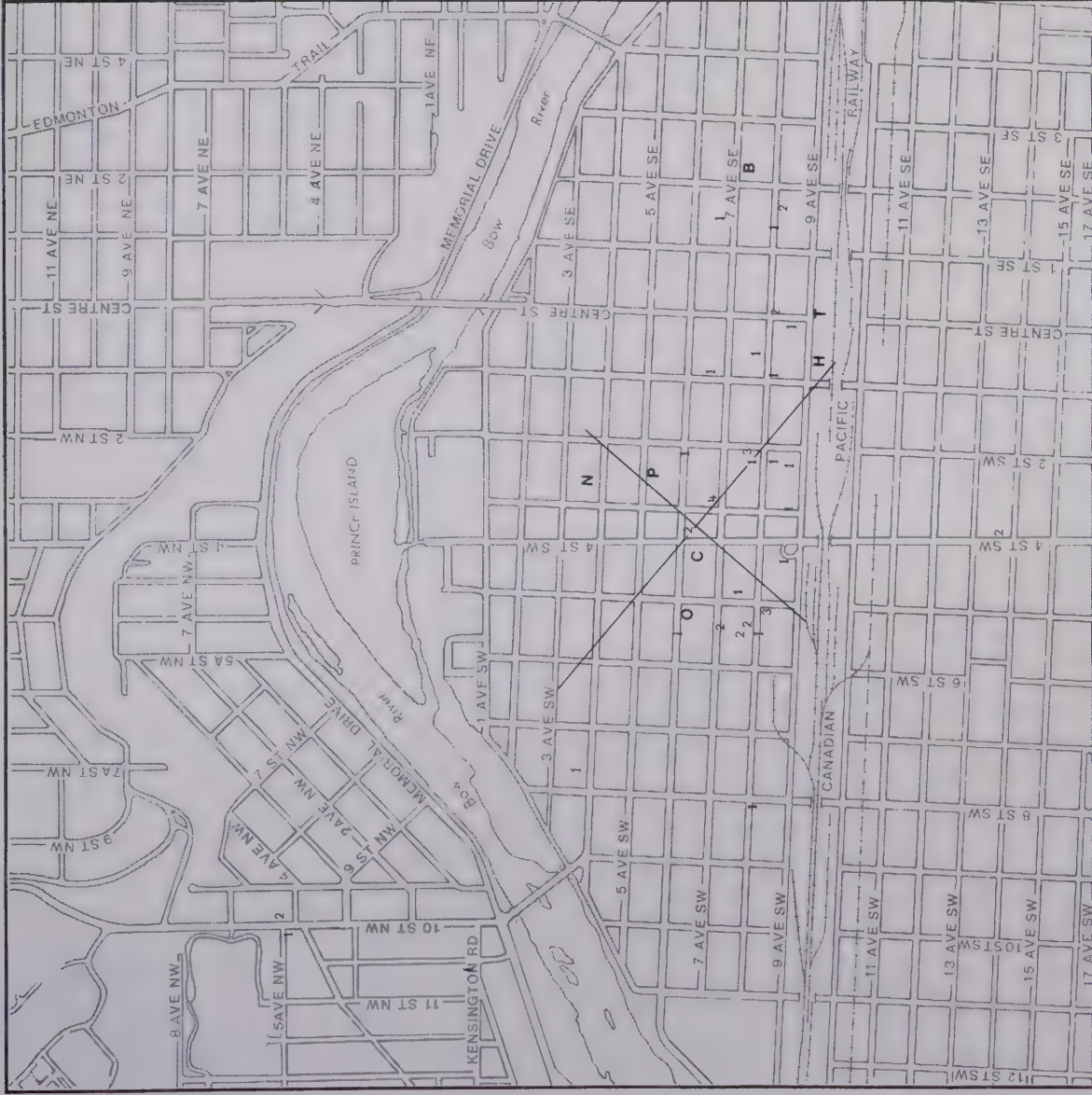
- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure III







# **GEOPHYSICAL AND EXPLORATION DRILLING CONTRACTORS 1954-55**

**CALGARY  
CENTRAL AREA EXCLUDED**

**NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.**

**CENTRAL AREA**



**SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.**

**Figure 112**



# **GEOPHYSICAL AND EXPLORATION DRILLING CONTRACTORS**

**1954-55**

## **CENTRAL CALGARY**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 113







# **GEOPHYSICAL AND EXPLORATION DRILLING CONTRACTORS 1959-60**

**CALGARY  
CENTRAL AREA EXCLUDED**

**NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.**

**CENTRAL AREA**



**SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.**

**Figure 114**



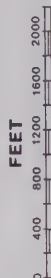
# GEOPHYSICAL AND EXPLORATION DRILLING CONTRACTORS 1959-60

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House
- T Husky Tower
- B City Hall and Administration Building



SOURCE: NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 115







**CALGARY**  
**CENTRAL AREA EXCLUDED**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

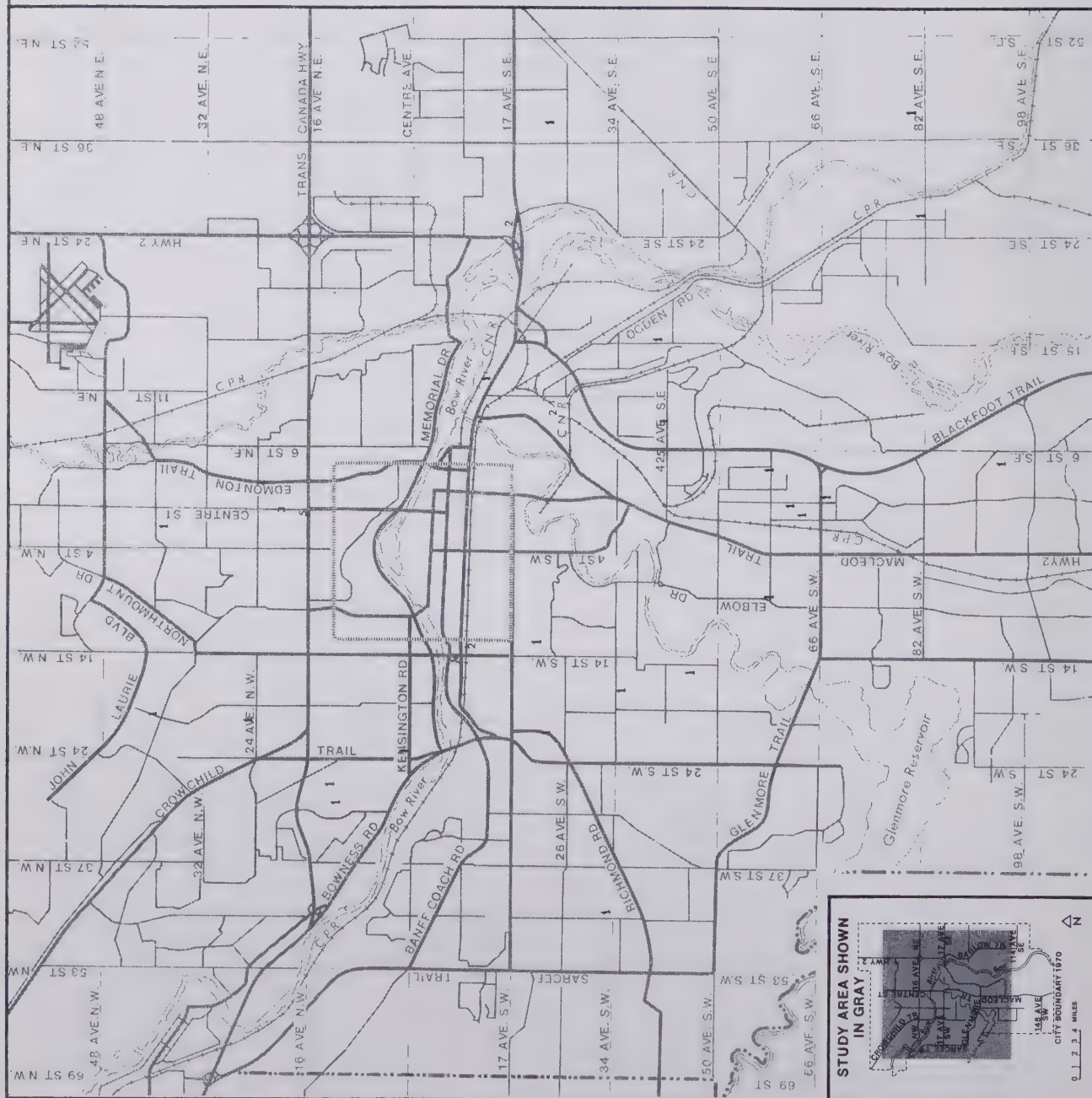
CENTRAL AREA

A vertical scale bar labeled "FEET" with markings from 0 to 12,000 in increments of 2,000. The scale is oriented vertically, with 0 at the bottom and 12,000 at the top.

SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 116

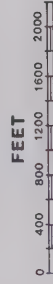


# **GEOPHYSICAL AND EXPLORATION DRILLING CONTRACTORS 1964-65 CENTRAL CALGARY**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

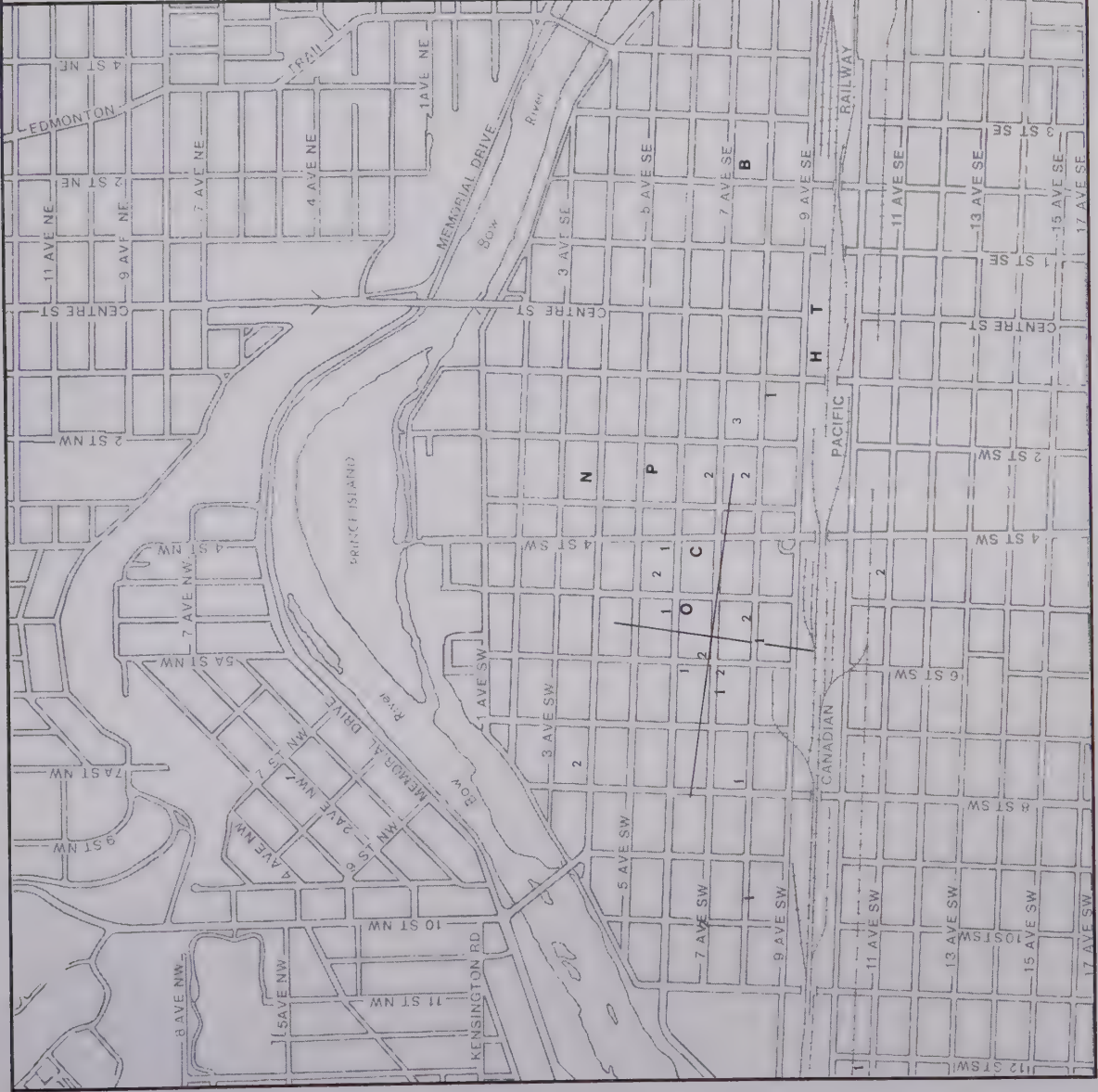
— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 117







# **GEOPHYSICAL AND EXPLORATION DRILLING CONTRACTORS 1969-70**

**CALGARY**  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

————— CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 118



# **GEOPHYSICAL AND EXPLORATION DRILLING CONTRACTORS 1969-70**

## **CENTRAL CALGARY**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

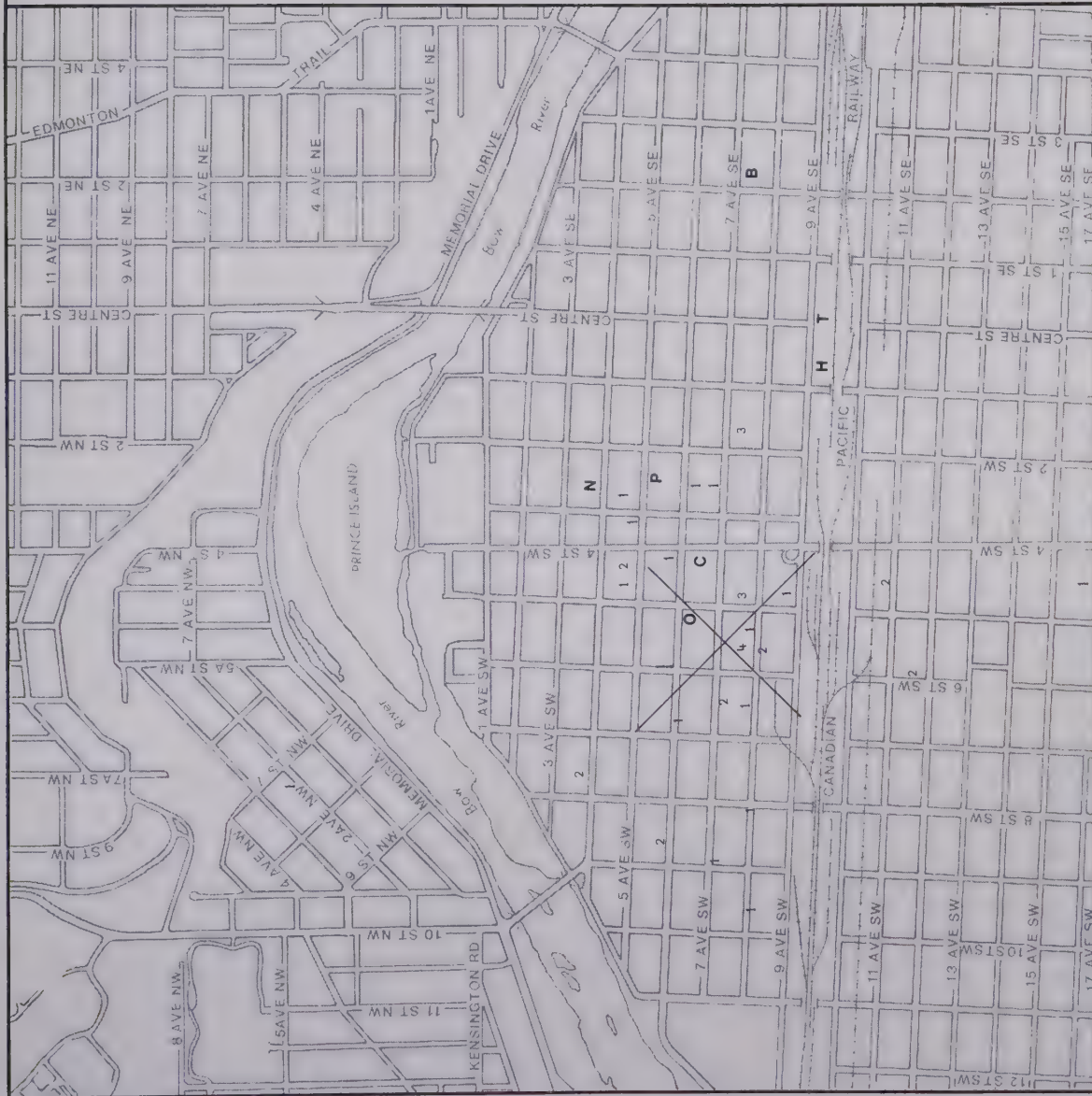
— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 119

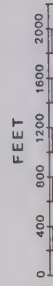




# GEOPHYSICAL AND EXPLORATION DRILLING CONTRACTORS CENTRAL CALGARY

## STANDARD DISTANCE PARAMETER

- 1 1950-51
- 2 1954-55
- 3 1959-60
- 4 1964-65
- 5 1969-70



G. H. Z.

Figure 126





# OILWELL SERVICING

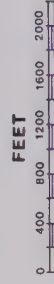
1954-55

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 121







# OILWELL SERVICING 1959-60

CALGARY  
CENTRAL AREA EXCLUDED

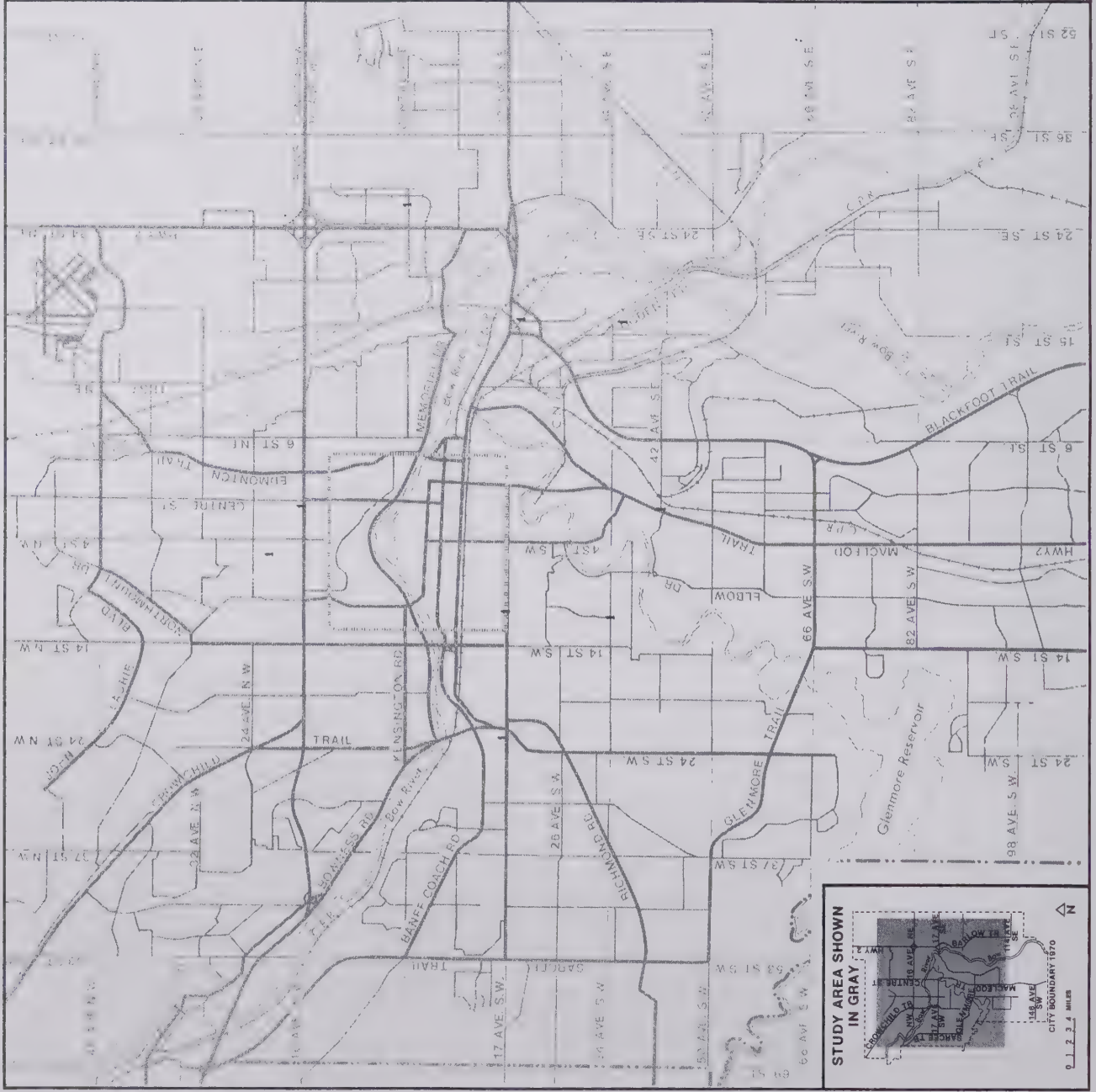
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 122



# OILWELL SERVICING

1959-60

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

—+— STANDARD DISTANCE  
PARAMETER

- |   |                                       |
|---|---------------------------------------|
| O | Oil and Gas Conservation Board        |
| P | Petroleum Club                        |
| N | Calgary Inn                           |
| H | Palliser Hotel                        |
| C | Court House, Land Titles Office       |
| T | Husky Tower                           |
| B | City Hall and Administration Building |



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 123







# OILWELL SERVICING 1964-65

CALGARY  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA

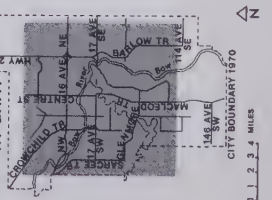


SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 124



STUDY AREA SHOWN  
IN GRAY



0 1 2 3 4 MILES

# OILWELL SERVICING 1964-65

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 125





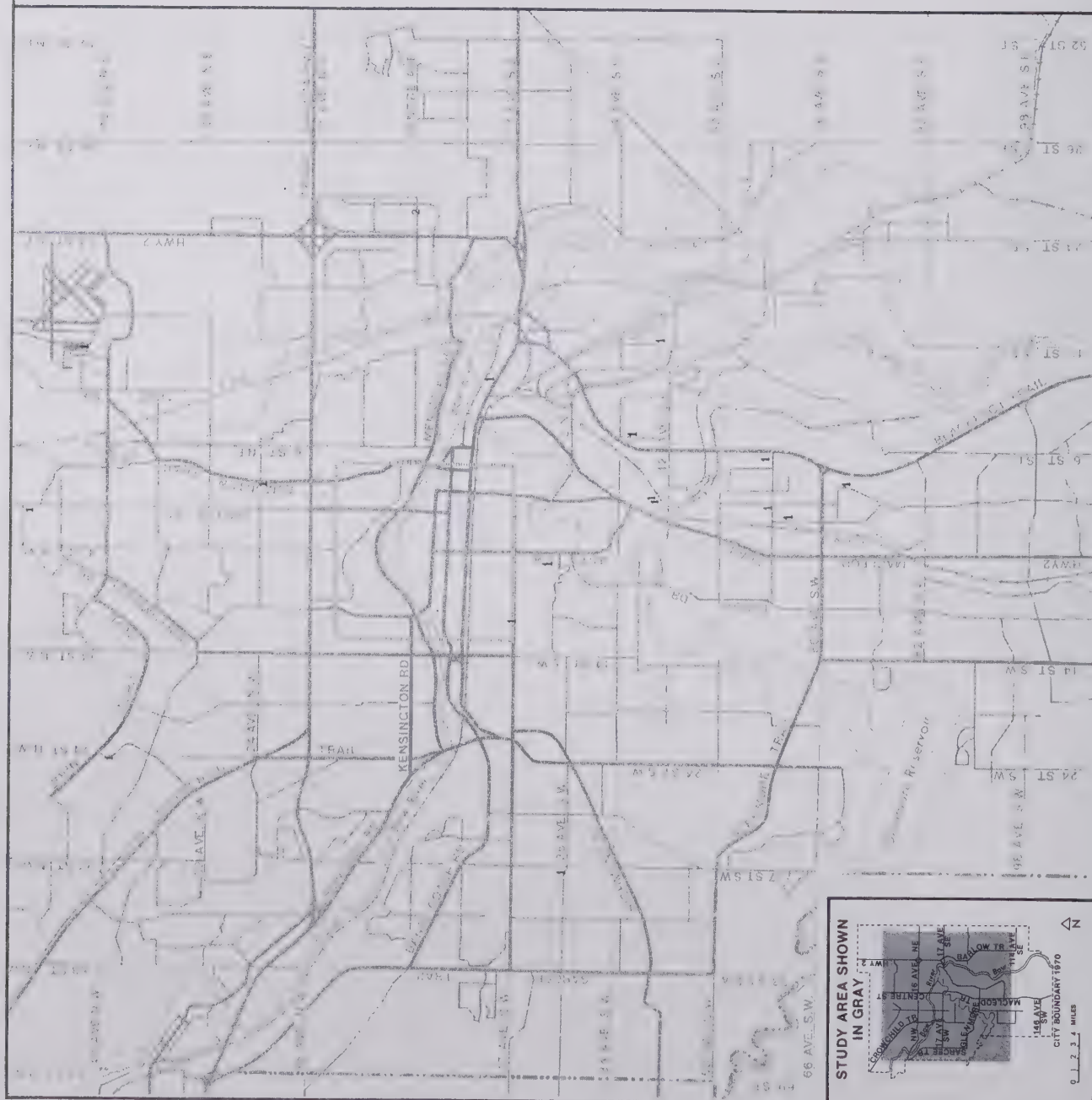


NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA

SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 126



# OILWELL SERVICING 1969-70

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House
- T Land Titles Office
- B Husky Tower
- City Hall and Administration Building



SOURCE: NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 127





**CENTRAL CALGARY**

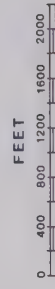
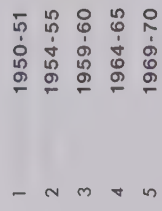


Figure 128



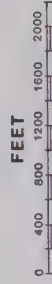
# PIPELINE COMPANIES, POWER DISTRIBUTORS 1950-51

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 129





# PIPELINE COMPANIES, POWER DISTRIBUTORS

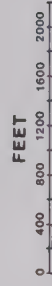
1954-55

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

—+— STANDARD DISTANCE  
PARAMETER

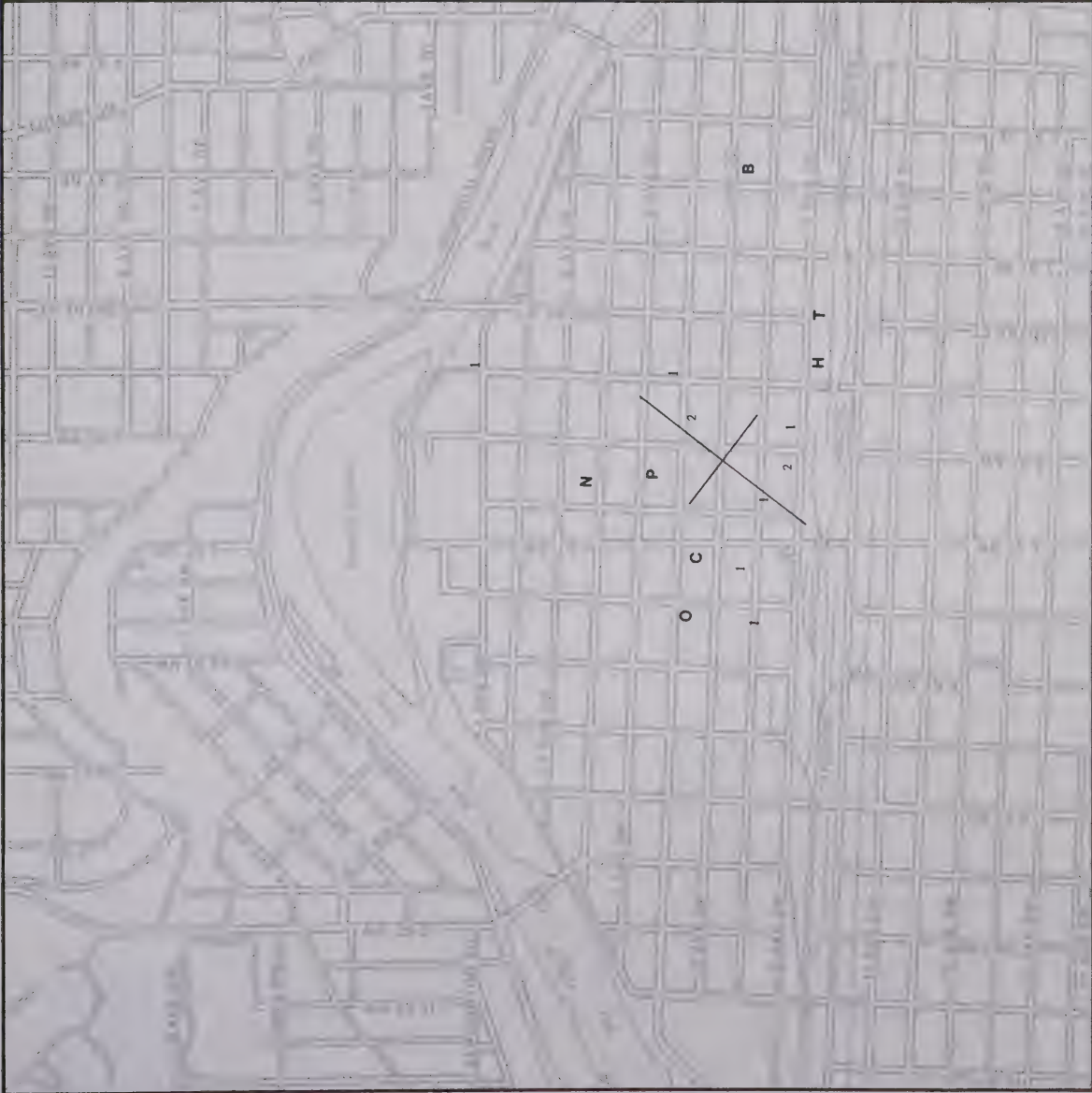
- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 130







# PIPELINE COMPANIES, POWER DISTRIBUTORS 1959-60

CALGARY  
CENTRAL AREA EXCLUDED

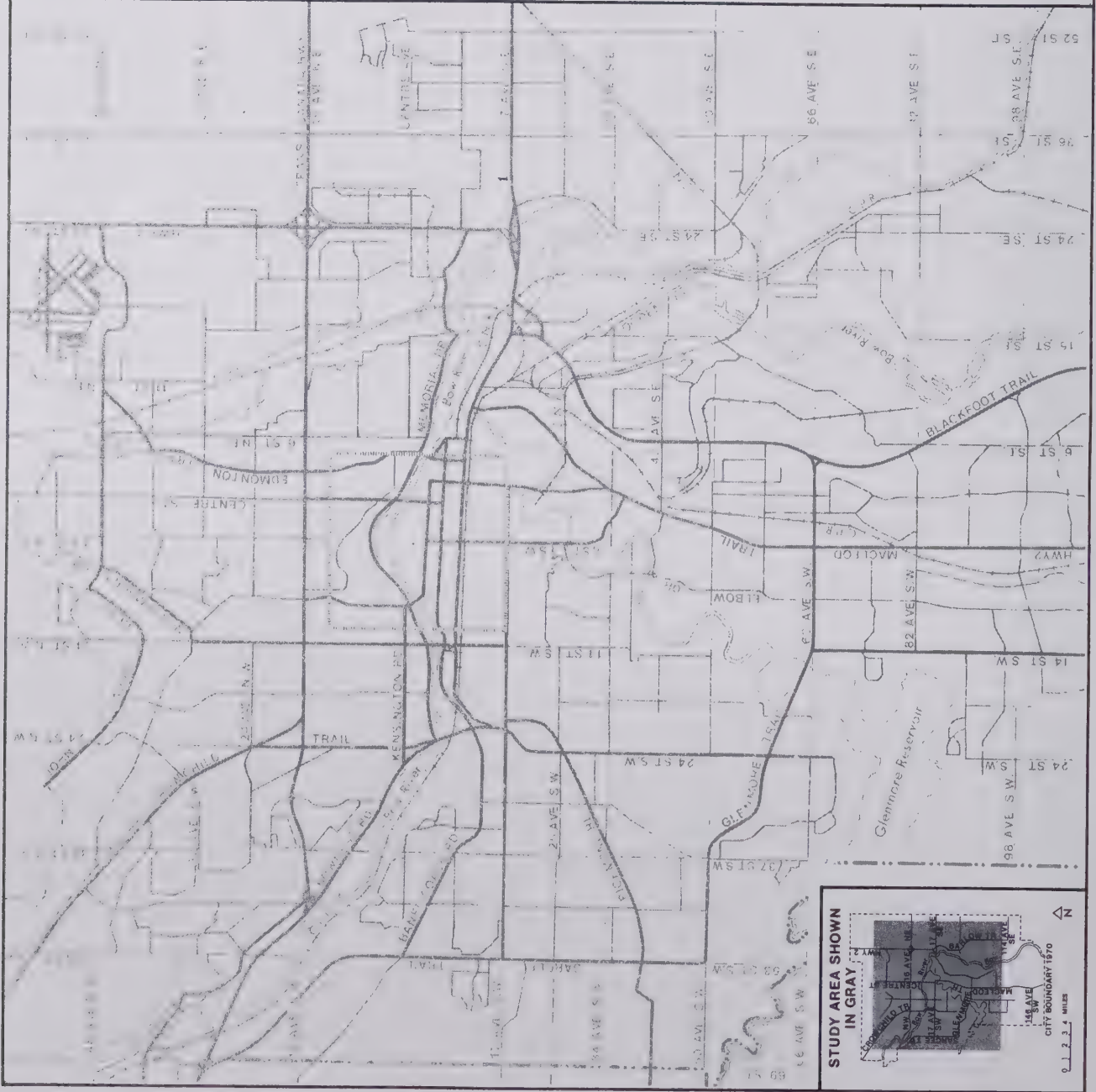
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 131



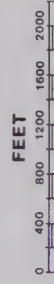
# PIPELINE COMPANIES, POWER DISTRIBUTORS 1959-60

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

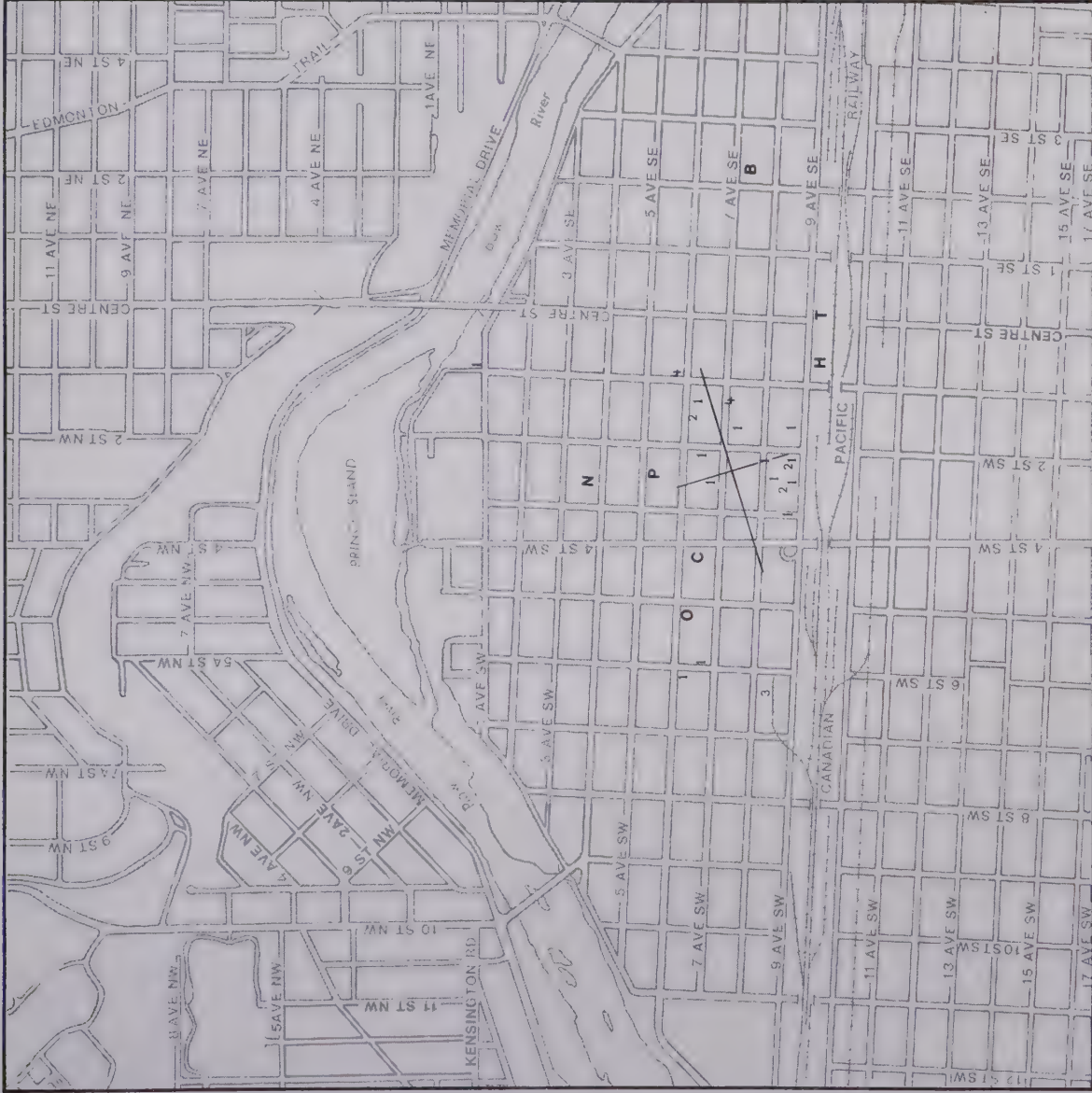
— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE: NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 132





# PIPELINE COMPANIES, POWER DISTRIBUTORS

1964-65

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

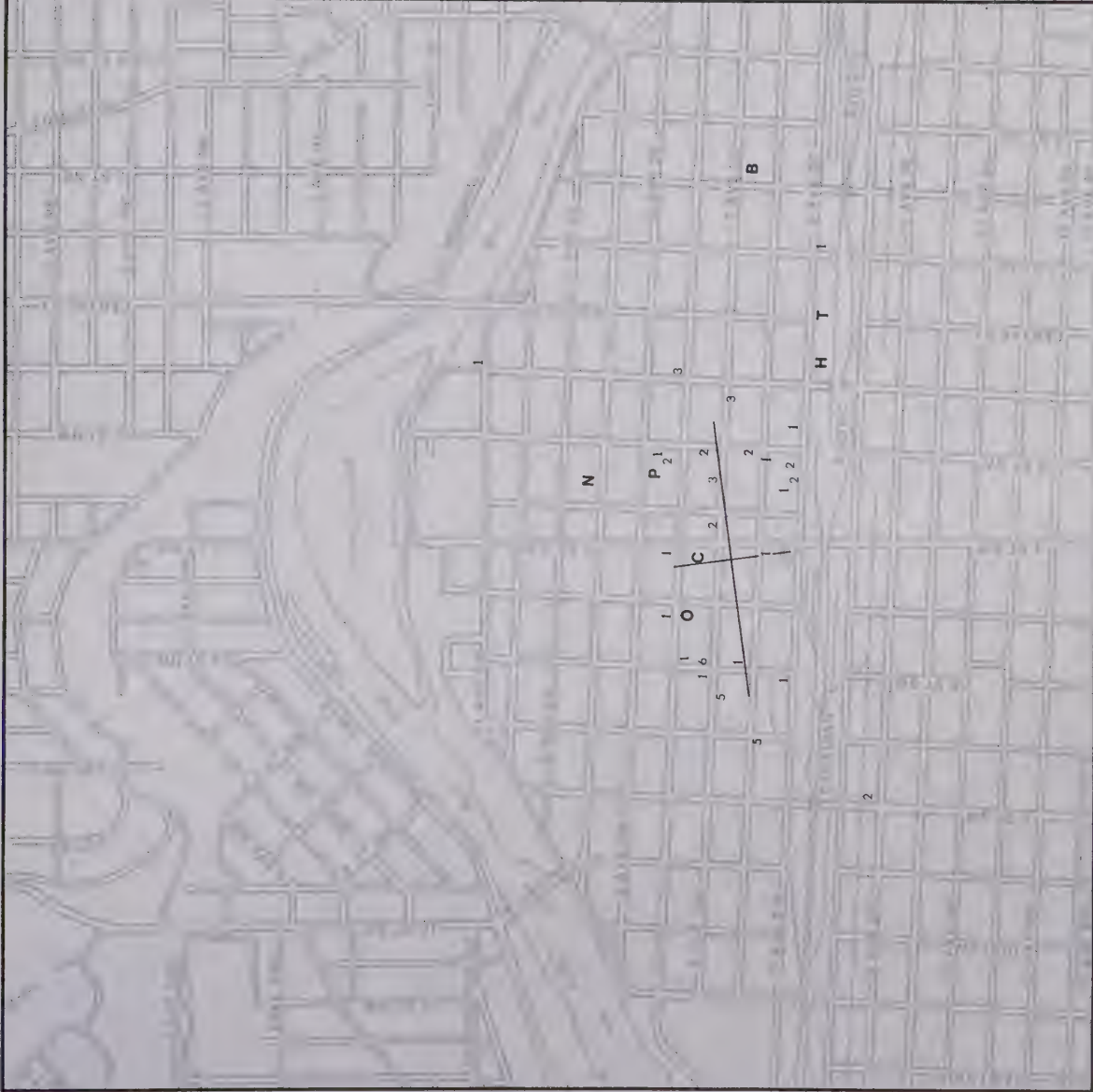
— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 133







# PIPELINE COMPANIES, POWER DISTRIBUTORS 1969-70

## CALGARY CENTRAL AREA EXCLUDED

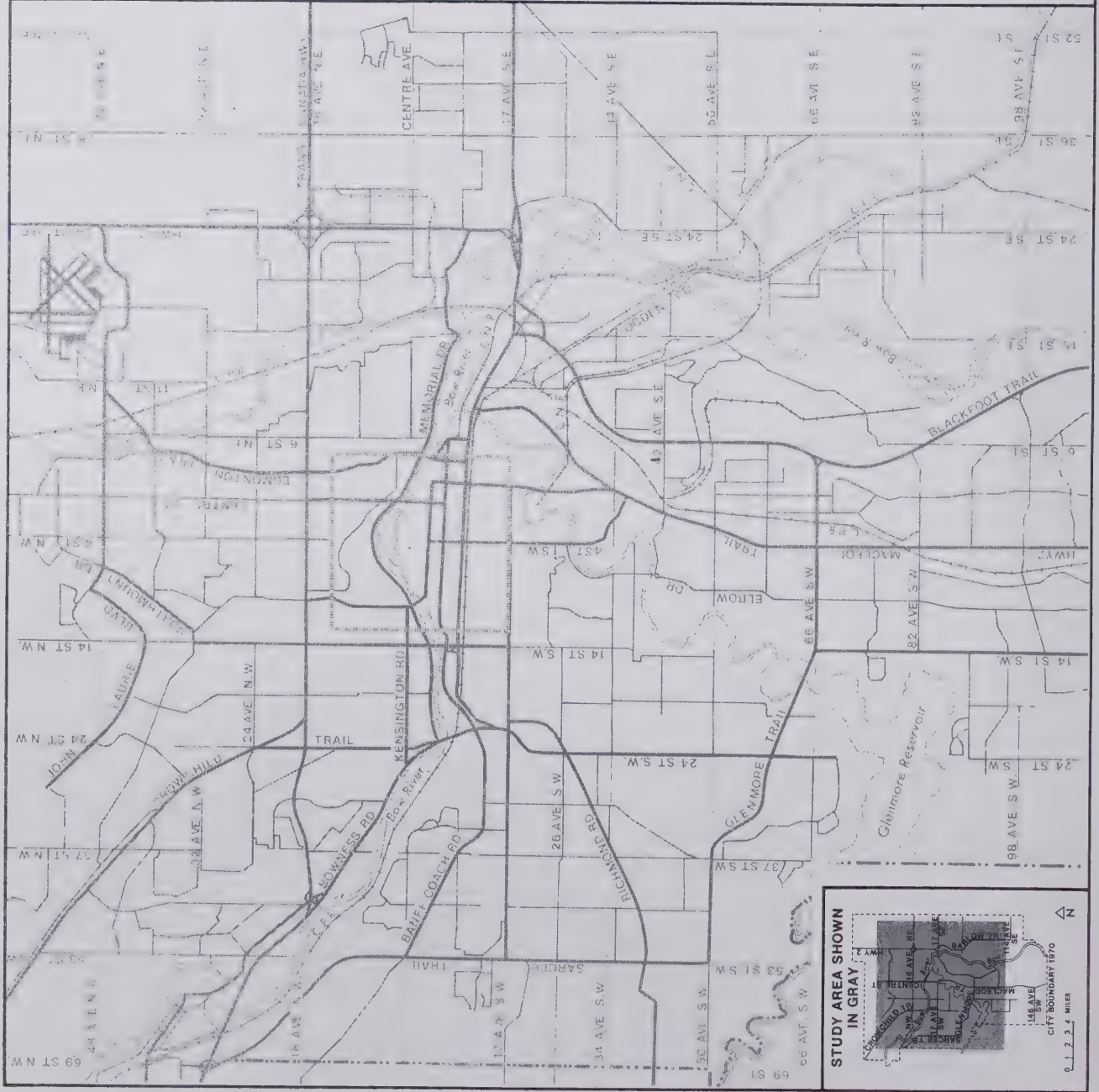
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 134



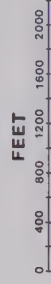
# PIPELINE COMPANIES, POWER DISTRIBUTORS 1969-70

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE: NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

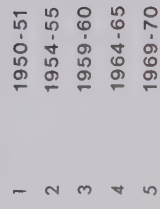
Figure 135





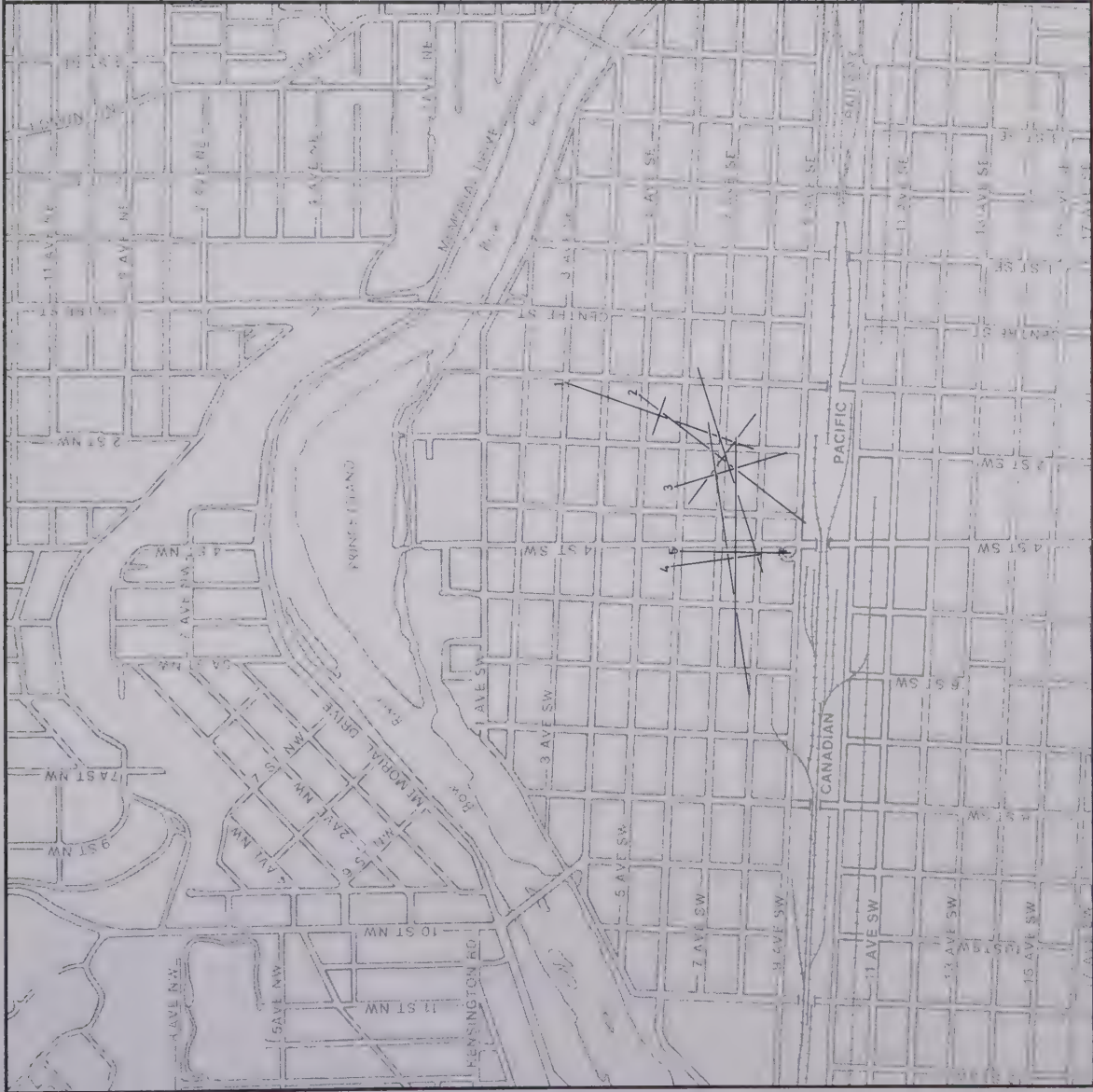
**PIPELINE  
COMPANIES,  
POWER  
DISTRIBUTORS**

**CENTRAL CALGARY**



G. H. Z.

Figure 136







# REFINERS, PROCESSORS, MARKETERS, PLANT OPERATORS 1950-51

CALGARY  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

— CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 137



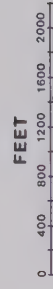
# REFINERS, PROCESSORS, MARKETERS, PLANT OPERATORS 1950-51

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

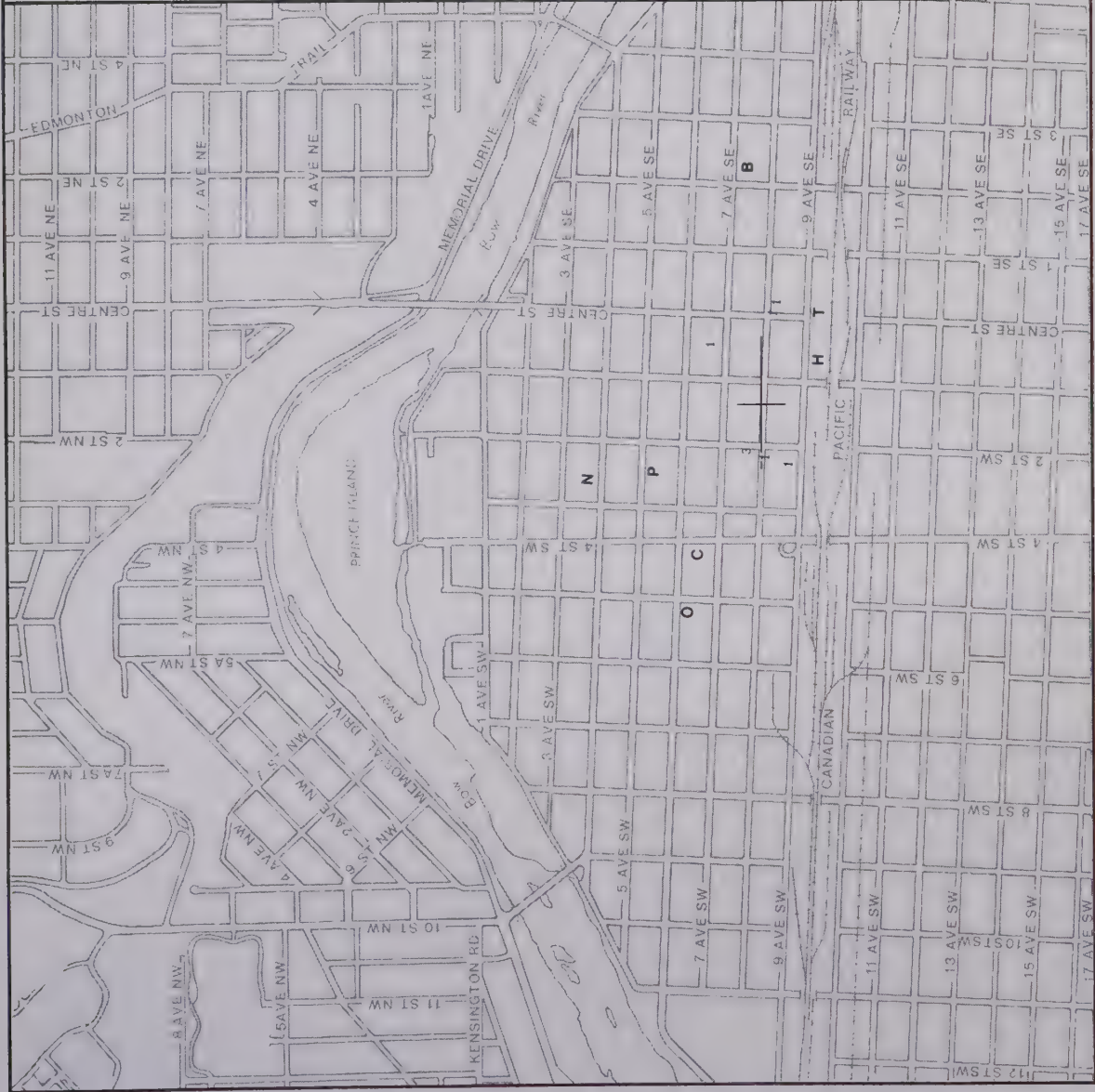
— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House
- T Land Titles Office
- B Husky Tower
- City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 138







# REFINERS, PROCESSORS, MARKETERS, PLANT OPERATORS 1954-55

CALGARY  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE: NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 139



# REFINERS, PROCESSORS, MARKETERS, PLANT OPERATORS

1954-55

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

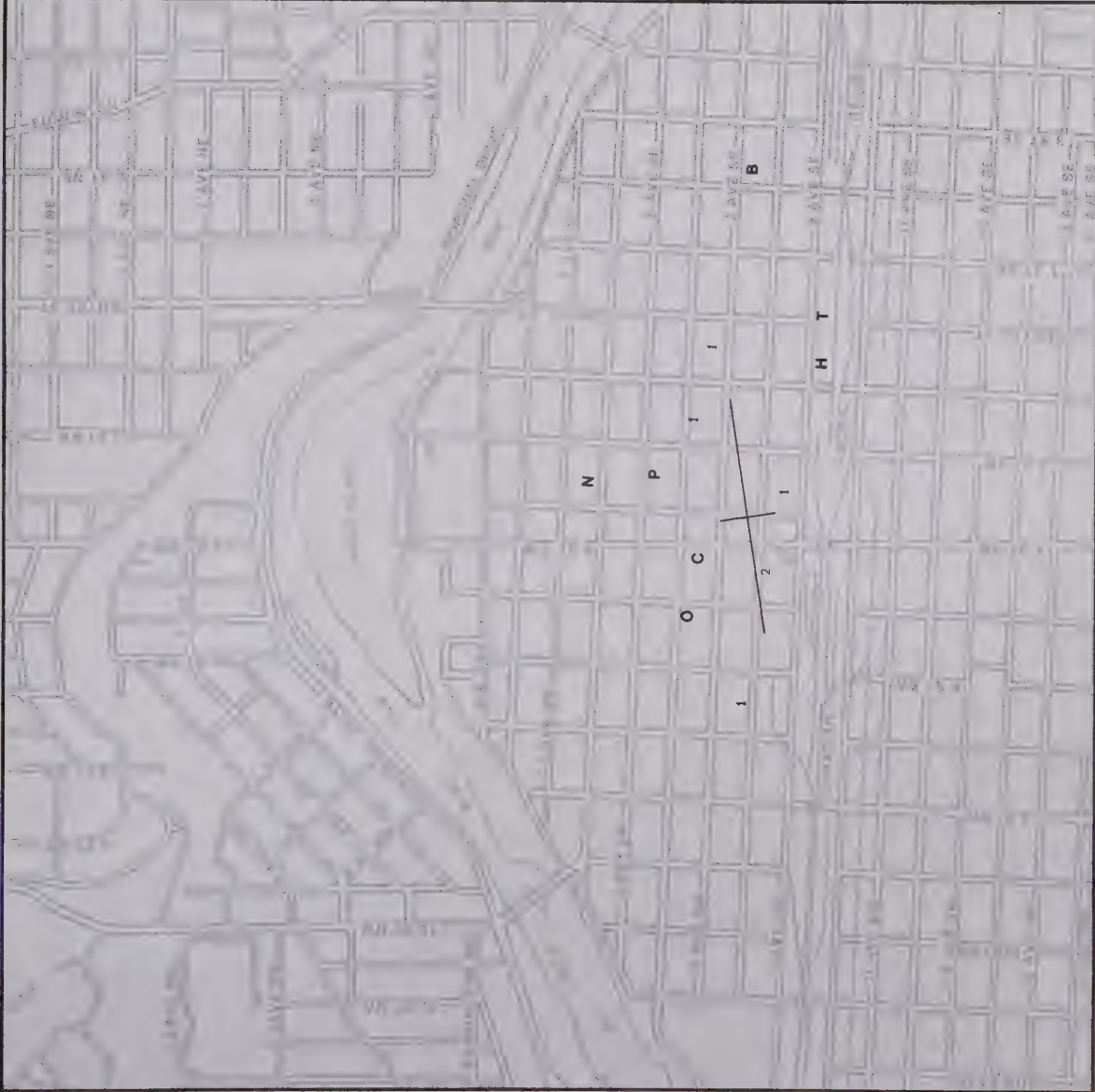
— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 140







# REFINERS, PROCESSORS, MARKETERS, PLANT OPERATORS 1959-60

CALGARY  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 141



# REFINERS, PROCESSORS, MARKETERS, PLANT OPERATORS 1959-60

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

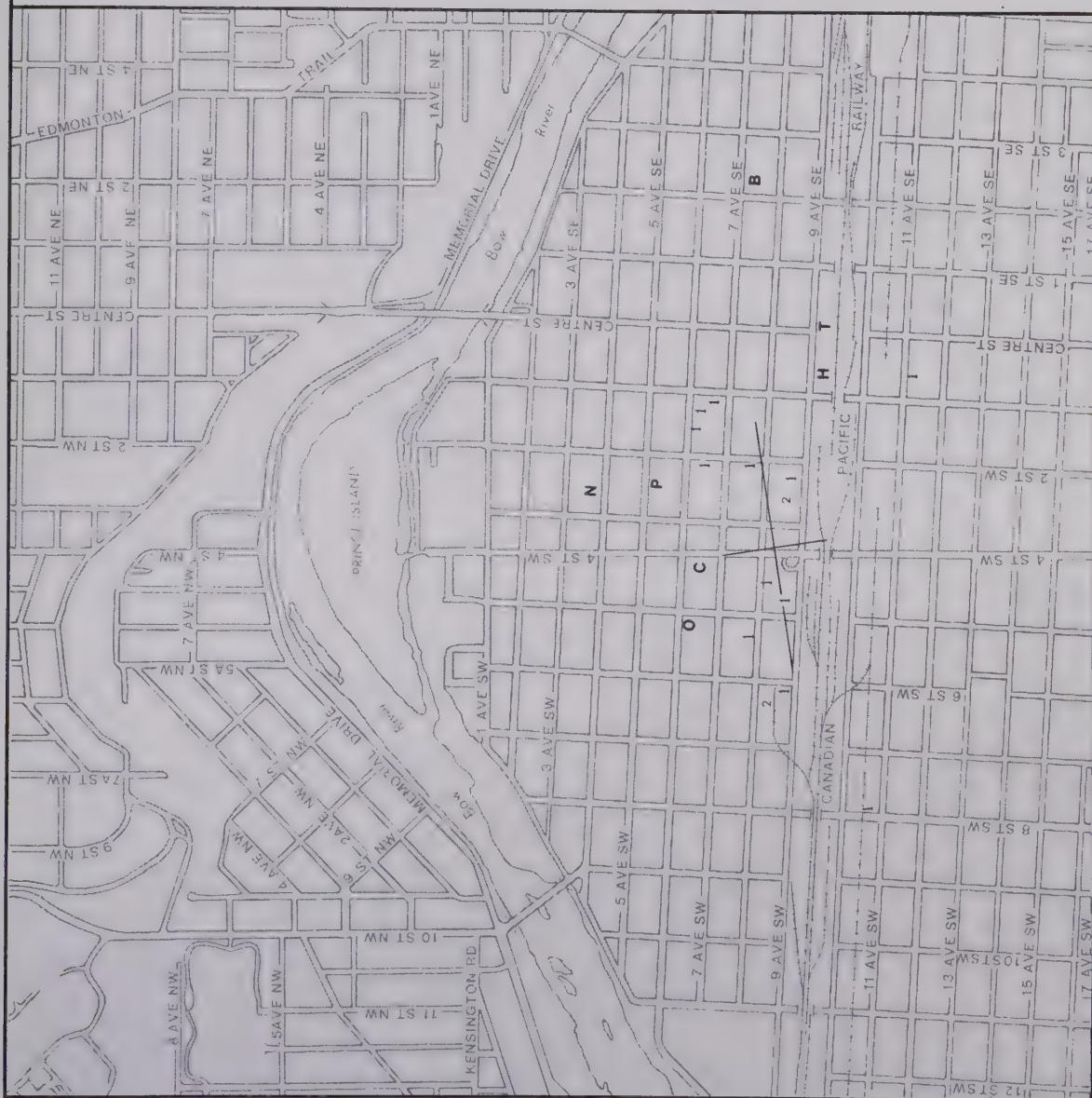
- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 142







**CALGARY**  
**CENTRAL AREA EXCLUDED**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

**CENTRAL AREA**

FEET

0 2000 4000 6000 8000 10000 12000

**SOURCE : NICKLE'S CANADIAN OIL REGISTER**

G. H. Z.

Figure 143



# REFINERS, PROCESSORS, MARKETERS, PLANT OPERATORS 1964-65

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 144







# REFINERS, PROCESSORS, MARKETERS, PLANT OPERATORS 1969-70

CALGARY  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.



# REFINERS, PROCESSORS, MARKETERS, PLANT OPERATORS 1969-70

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

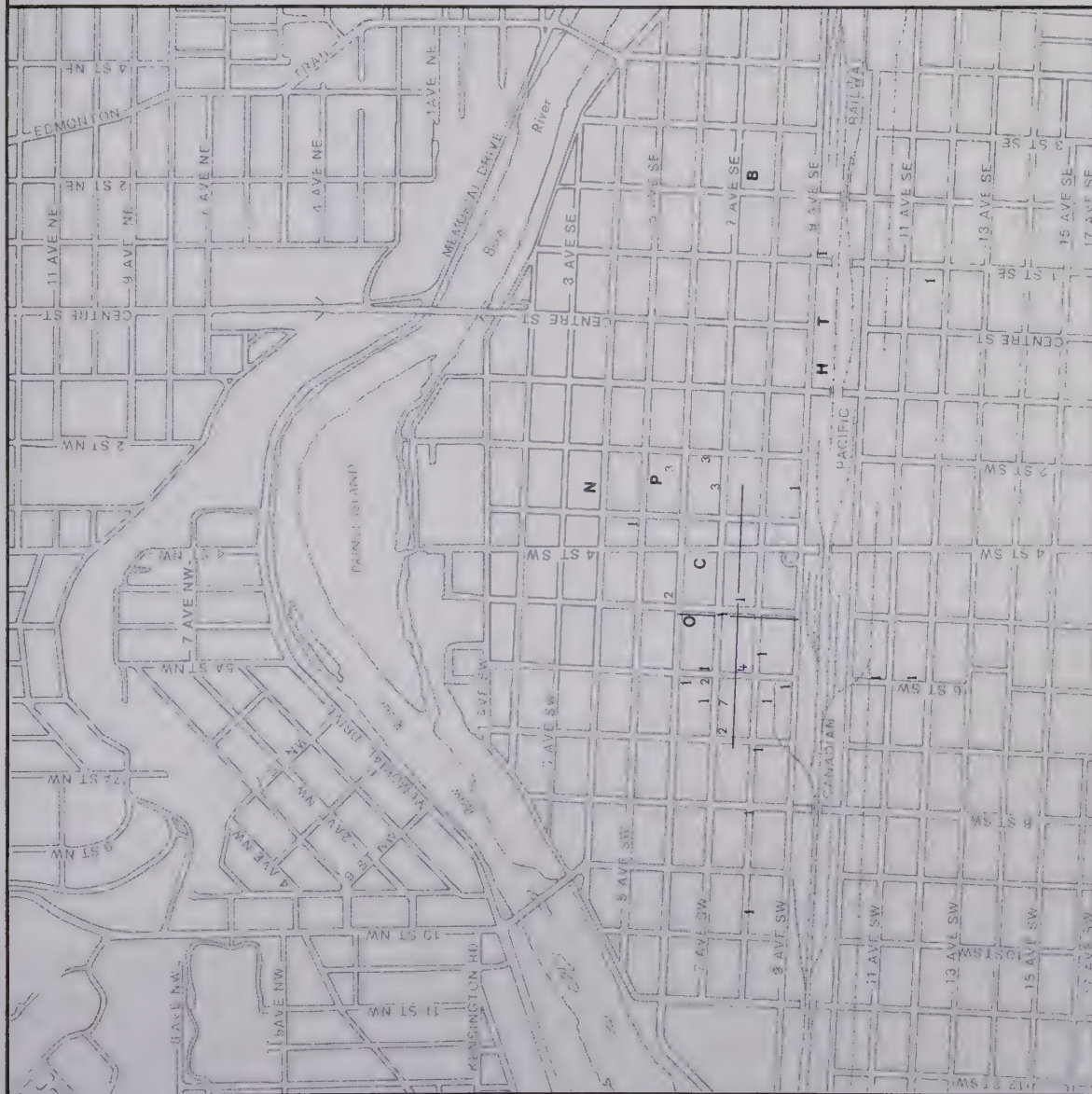
— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 146





# REFINERS, PROCESSORS, MARKETERS, PLANT OPERATORS

## CENTRAL CALGARY

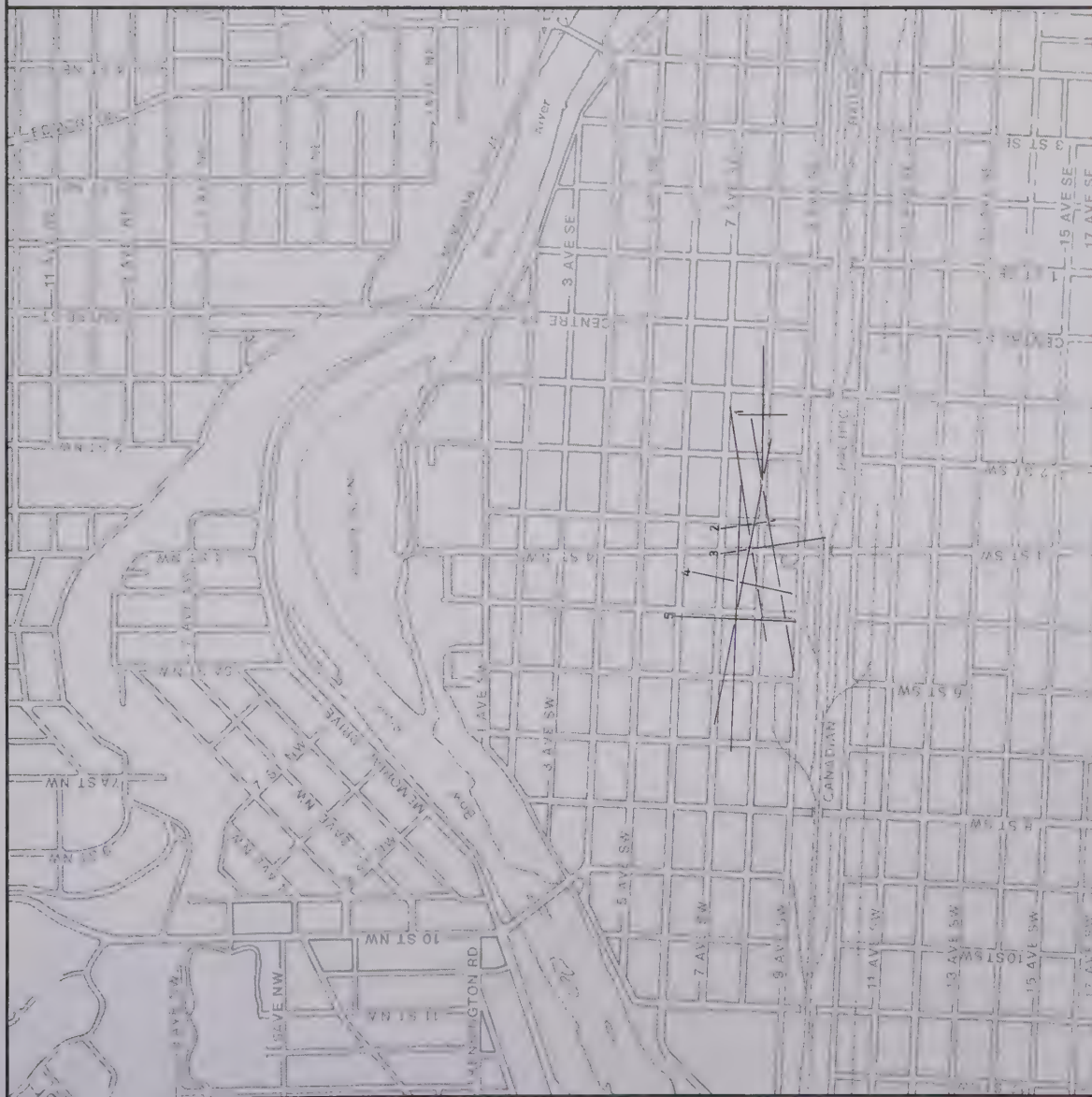
### STANDARD DISTANCE PARAMETER

- 1 1950-51
- 2 1954-55
- 3 1959-60
- 4 1964-65
- 5 1969-70



G. H. Z.

Figure 147







# TRANSPORTATION, OILFIELD CONSTRUCTION 1964-65

CALGARY  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE: NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 148



# TRANSPORTATION, OILFIELD CONSTRUCTION

1964-65

## CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

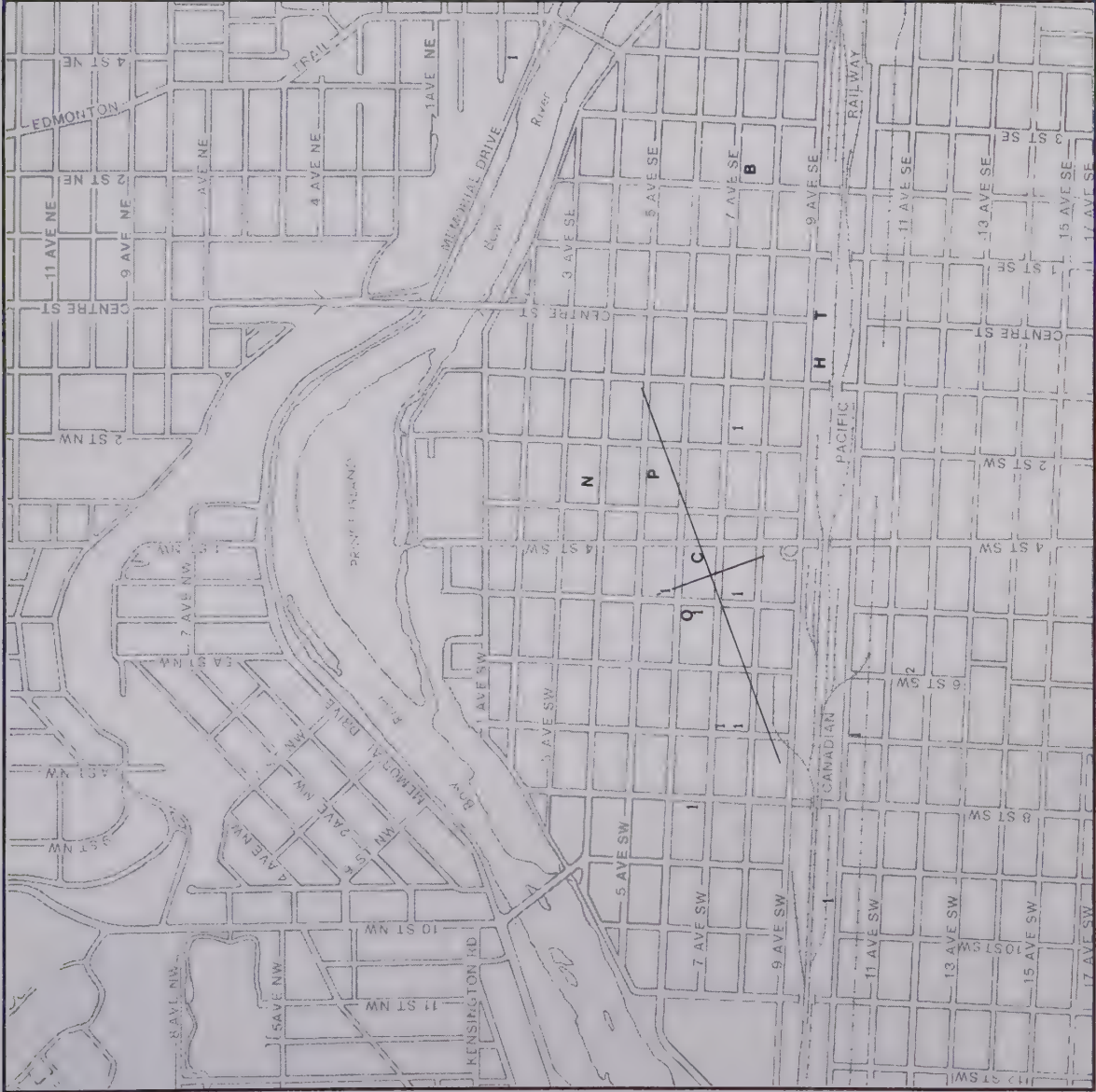
- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House , Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 149







# TRANSPORTATION, OILFIELD CONSTRUCTION

1969-70

CALGARY  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.



# TRANSPORTATION, OILFIELD CONSTRUCTION 1969-70 CENTRAL CALGARY

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- O Oil and Gas Conservation Board
- P Petroleum Club
- N Calgary Inn
- H Palliser Hotel
- C Court House, Land Titles Office
- T Husky Tower
- B City Hall and Administration Building



SOURCE: NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 151

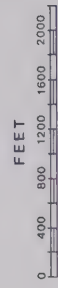




# TRANSPORTATION, OILFIELD CONSTRUCTION CENTRAL CALGARY

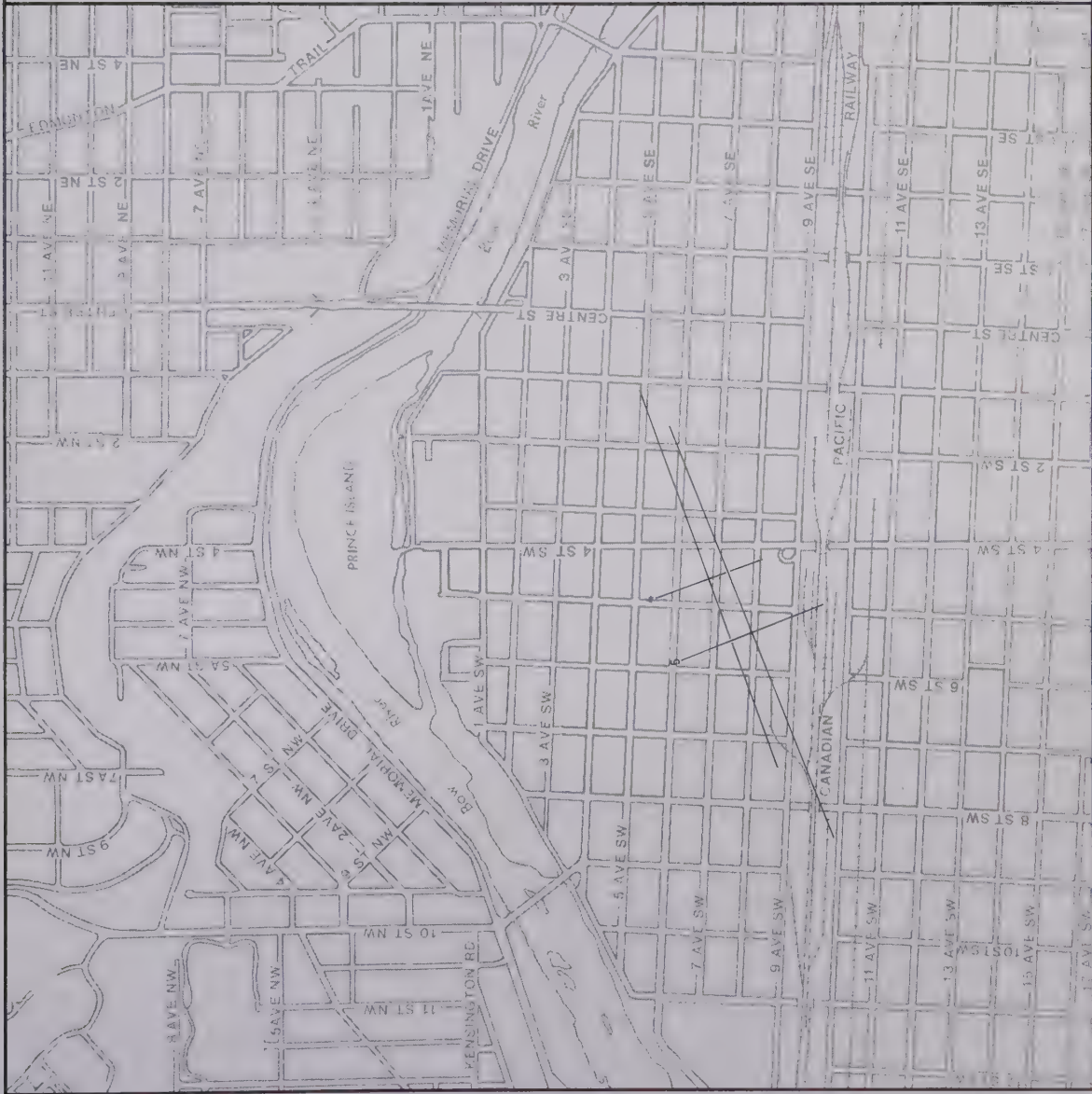
## STANDARD DISTANCE PARAMETER

- |   |         |
|---|---------|
| 1 | 1950-51 |
| 2 | 1954-55 |
| 3 | 1959-60 |
| 4 | 1964-65 |
| 5 | 1969-70 |



G. H. Z.

Figure 152





OIL OPERATIONS OFFICES,  
EDMONTON





# SERVICE AND SUPPLY 1950-51

EDMONTON  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

— CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 153



## 1950-51

**CENTRAL EDMONTON**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

PARAMETER	STANDARD DISTANCE
1. $\mu_1$	0.0000
2. $\mu_2$	0.0000
3. $\mu_3$	0.0000
4. $\mu_4$	0.0000
5. $\mu_5$	0.0000
6. $\mu_6$	0.0000
7. $\mu_7$	0.0000
8. $\mu_8$	0.0000
9. $\mu_9$	0.0000
10. $\mu_{10}$	0.0000
11. $\mu_{11}$	0.0000
12. $\mu_{12}$	0.0000
13. $\mu_{13}$	0.0000
14. $\mu_{14}$	0.0000
15. $\mu_{15}$	0.0000
16. $\mu_{16}$	0.0000
17. $\mu_{17}$	0.0000
18. $\mu_{18}$	0.0000
19. $\mu_{19}$	0.0000
20. $\mu_{20}$	0.0000
21. $\mu_{21}$	0.0000
22. $\mu_{22}$	0.0000
23. $\mu_{23}$	0.0000
24. $\mu_{24}$	0.0000
25. $\mu_{25}$	0.0000
26. $\mu_{26}$	0.0000
27. $\mu_{27}$	0.0000
28. $\mu_{28}$	0.0000
29. $\mu_{29}$	0.0000
30. $\mu_{30}$	0.0000
31. $\mu_{31}$	0.0000
32. $\mu_{32}$	0.0000
33. $\mu_{33}$	0.0000
34. $\mu_{34}$	0.0000
35. $\mu_{35}$	0.0000
36. $\mu_{36}$	0.0000
37. $\mu_{37}$	0.0000
38. $\mu_{38}$	0.0000
39. $\mu_{39}$	0.0000
40. $\mu_{40}$	0.0000
41. $\mu_{41}$	0.0000
42. $\mu_{42}$	0.0000
43. $\mu_{43}$	0.0000
44. $\mu_{44}$	0.0000
45. $\mu_{45}$	0.0000
46. $\mu_{46}$	0.0000
47. $\mu_{47}$	0.0000
48. $\mu_{48}$	0.0000
49. $\mu_{49}$	0.0000
50. $\mu_{50}$	0.0000
51. $\mu_{51}$	0.0000
52. $\mu_{52}$	0.0000
53. $\mu_{53}$	0.0000
54. $\mu_{54}$	0.0000
55. $\mu_{55}$	0.0000
56. $\mu_{56}$	0.0000
57. $\mu_{57}$	0.0000
58. $\mu_{58}$	0.0000
59. $\mu_{59}$	0.0000
60. $\mu_{60}$	0.0000
61. $\mu_{61}$	0.0000
62. $\mu_{62}$	0.0000
63. $\mu_{63}$	0.0000
64. $\mu_{64}$	0.0000
65. $\mu_{65}$	0.0000
66. $\mu_{66}$	0.0000
67. $\mu_{67}$	0.0000
68. $\mu_{68}$	0.0000
69. $\mu_{69}$	0.0000
70. $\mu_{70}$	0.0000
71. $\mu_{71}$	0.0000
72. $\mu_{72}$	0.0000
73. $\mu_{73}$	0.0000
74. $\mu_{74}$	0.0000
75. $\mu_{75}$	0.0000
76. $\mu_{76}$	0.0000
77. $\mu_{77}$	0.0000
78. $\mu_{78}$	0.0000
79. $\mu_{79}$	0.0000
80. $\mu_{80}$	0.0000
81. $\mu_{81}$	0.0000
82. $\mu_{82}$	0.0000
83. $\mu_{83}$	0.0000
84. $\mu_{84}$	0.0000
85. $\mu_{85}$	0.0000
86. $\mu_{86}$	0.0000
87. $\mu_{87}$	0.0000
88. $\mu_{88}$	0.0000
89. $\mu_{89}$	0.0000
90. $\mu_{90}$	0.0000
91. $\mu_{91}$	0.0000
92. $\mu_{92}$	0.0000
93. $\mu_{93}$	0.0000
94. $\mu_{94}$	0.0000
95. $\mu_{95}$	0.0000
96. $\mu_{96}$	0.0000
97. $\mu_{97}$	0.0000
98. $\mu_{98}$	0.0000
99. $\mu_{99}$	0.0000
100. $\mu_{100}$	0.0000

- |   |                              |
|---|------------------------------|
| H | City Hall                    |
| L | Land Titles Office           |
| C | Court House                  |
| G | Alberta Government Buildings |
| M | Macdonald Hotel              |
| A | Chateau Lacombe Hotel        |



**SOURCE : NICKLE'S CANADIAN OIL REGISTER**

G. H. Z.

Figure 154







# SERVICE AND SUPPLY 1954-55

EDMONTON  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

— CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.



# SERVICE AND SUPPLY

1954-55

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE: NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 156







# SERVICE AND SUPPLY 1959-60

EDMONTON  
CENTRAL AREA EXCLUDED

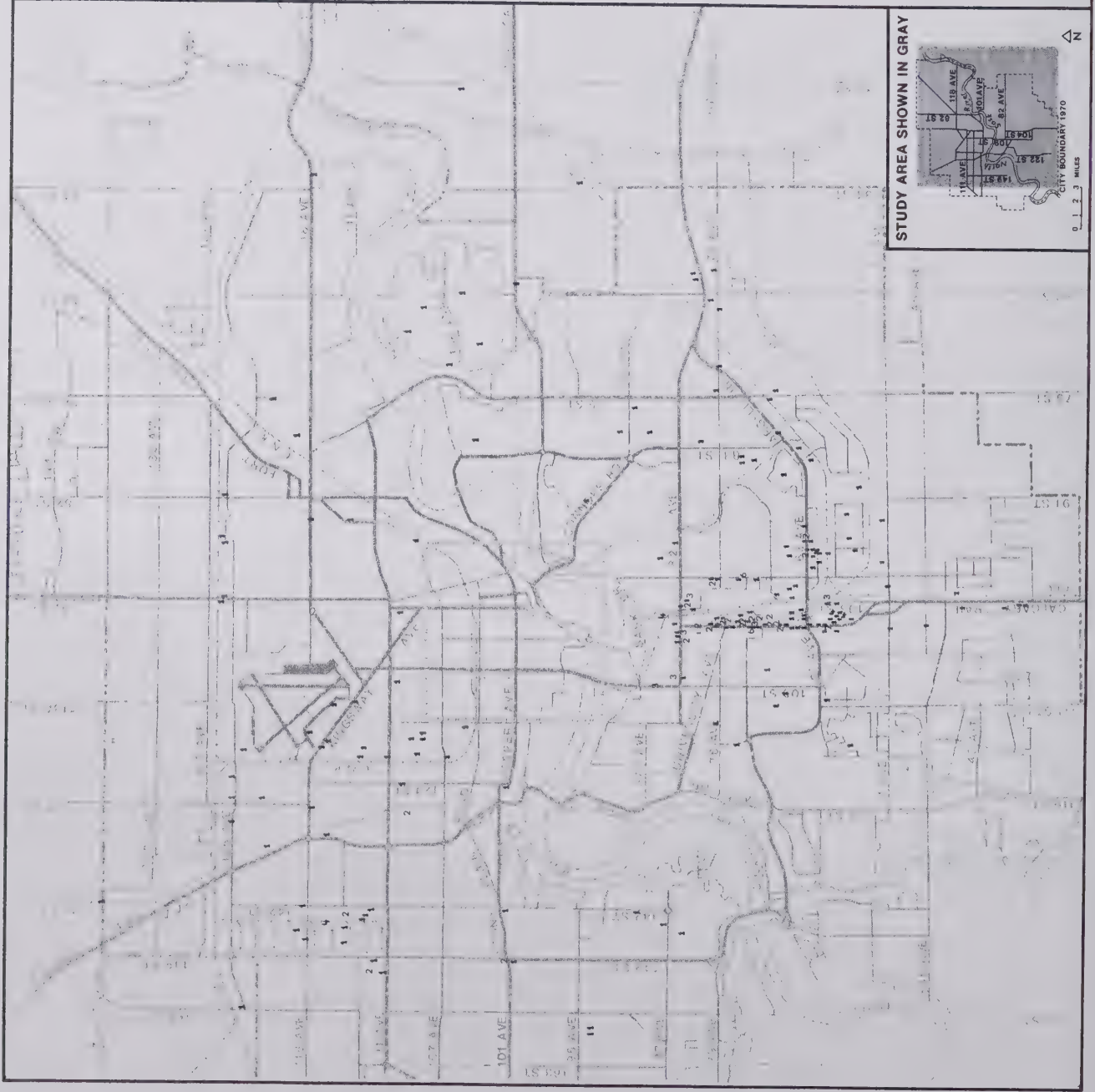
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

————— CENTRAL AREA



SOURCE: NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 157



# SERVICE AND SUPPLY

1959-60

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 158









# SERVICE AND SUPPLY

1964-65

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 160







## SERVICE AND SUPPLY 1969-70

**EDMONTON  
CENTRAL AREA EXCLUDED**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

## CENTRAL AREA



**SOURCE : NICKLE'S CANADIAN OIL REGISTER**

G. H. Z.

Figure 161

# SERVICE AND SUPPLY

1969-70

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 162



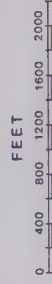


# SERVICE AND SUPPLY

## CENTRAL EDMONTON

### STANDARD DISTANCE PARAMETER

1	1950-51
2	1954-55
3	1959-60
4	1964-65
5	1969-70



G. H. Z.

Figure 163







# OILWELL DRILLING CONTRACTORS 1950-51

EDMONTON  
CENTRAL AREA EXCLUDED

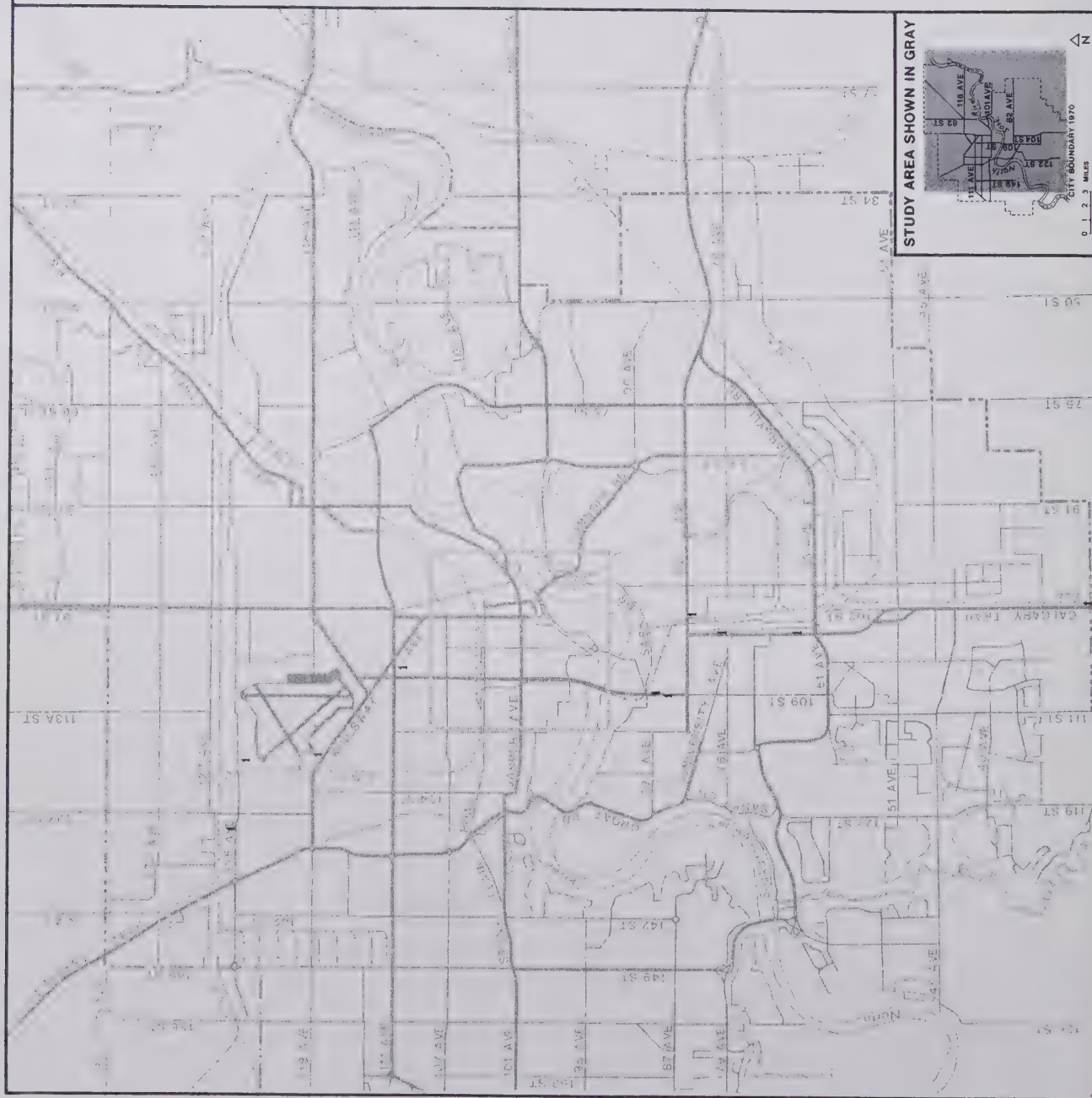
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 164



## 1950-51

**CENTRAL EDMONTON**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

+ STANDARD DISTANCE  
PARAMETER

- |   |                              |
|---|------------------------------|
| H | City Hall                    |
| L | Land Titles Office           |
| C | Court House                  |
| G | Alberta Government Buildings |
| M | Macdonald Hotel              |
| A | Chateau Lacombe Hotel        |



**SOURCE : NICKLE'S CANADIAN OIL REGISTER**

G. H. Z.

Figure 165









# OILWELL DRILLING CONTRACTORS

1954-55

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 167





# OILWELL DRILLING CONTRACTORS

1959-60

EDMONTON  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE: NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure / 68



STUDY AREA SHOWN IN GRAY



# OILWELL DRILLING CONTRACTORS 1959-60

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

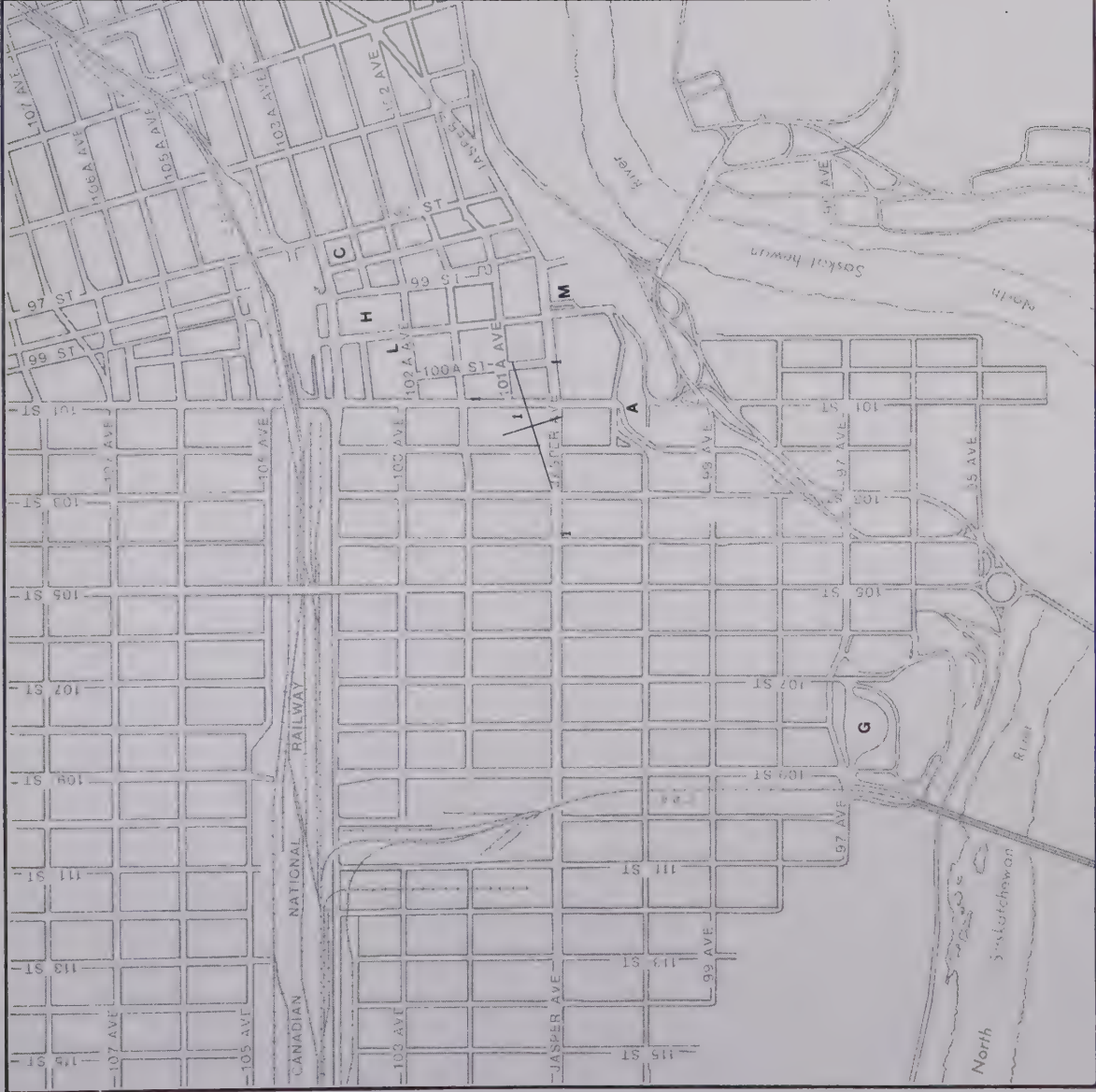
- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 169







# OILWELL DRILLING CONTRACTORS

1964-65

EDMONTON  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

————— CENTRAL AREA



SOURCE: NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 170





# **OILWELL DRILLING CONTRACTORS**

**1969-70**

**EDMONTON  
CENTRAL AREA EXCLUDED**

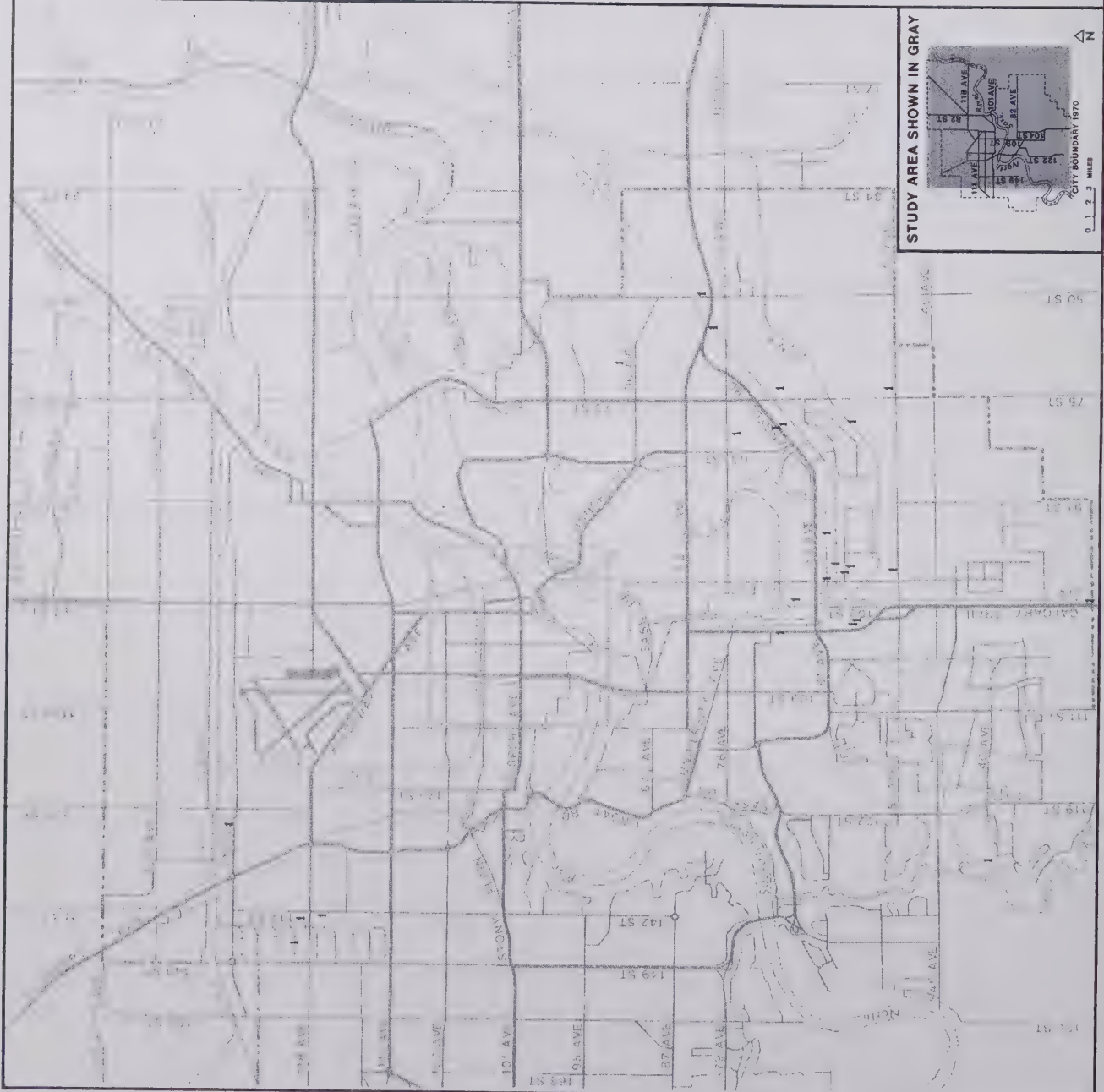
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

----- CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 171



STUDY AREA SHOWN IN GRAY



# OILWELL DRILLING CONTRACTORS

## CENTRAL EDMONTON

### STANDARD DISTANCE PARAMETER

1	1950-51
2	1954-55
3	1959-60
4	1964-65
5	1969-70



G. H. Z.

Figure 172







**EDMONTON**  
**CENTRAL AREA EXCLUDED**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA

A vertical number line labeled "FEET" at the top. The line has major tick marks at intervals of 2,000, starting from 0 at the bottom and going up to 12,000. The numbers 0, 2000, 4000, 6000, 8000, 10000, and 12000 are written next to their respective tick marks.

SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 173

# ENGINEERS, DESIGNERS, CONSTRUCTORS, FABRICATORS

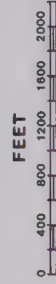
1959-60

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

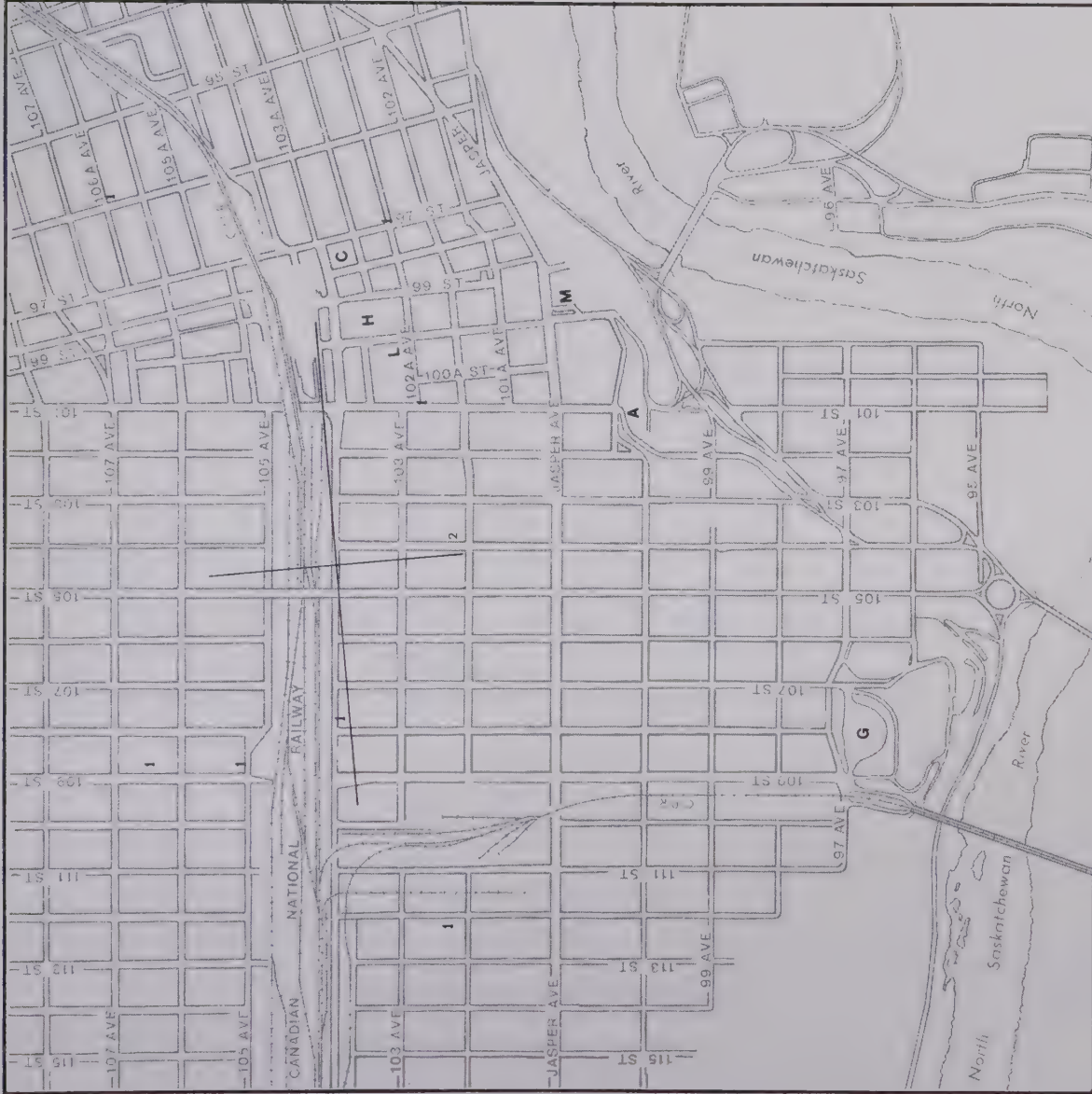
— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 174







# ENGINEERS, DESIGNERS, CONSTRUCTORS, FABRICATORS

1964-65

EDMONTON  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

————— CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 175



# ENGINEERS, DESIGNERS, CONSTRUCTORS, FABRICATORS

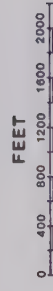
1964-65

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

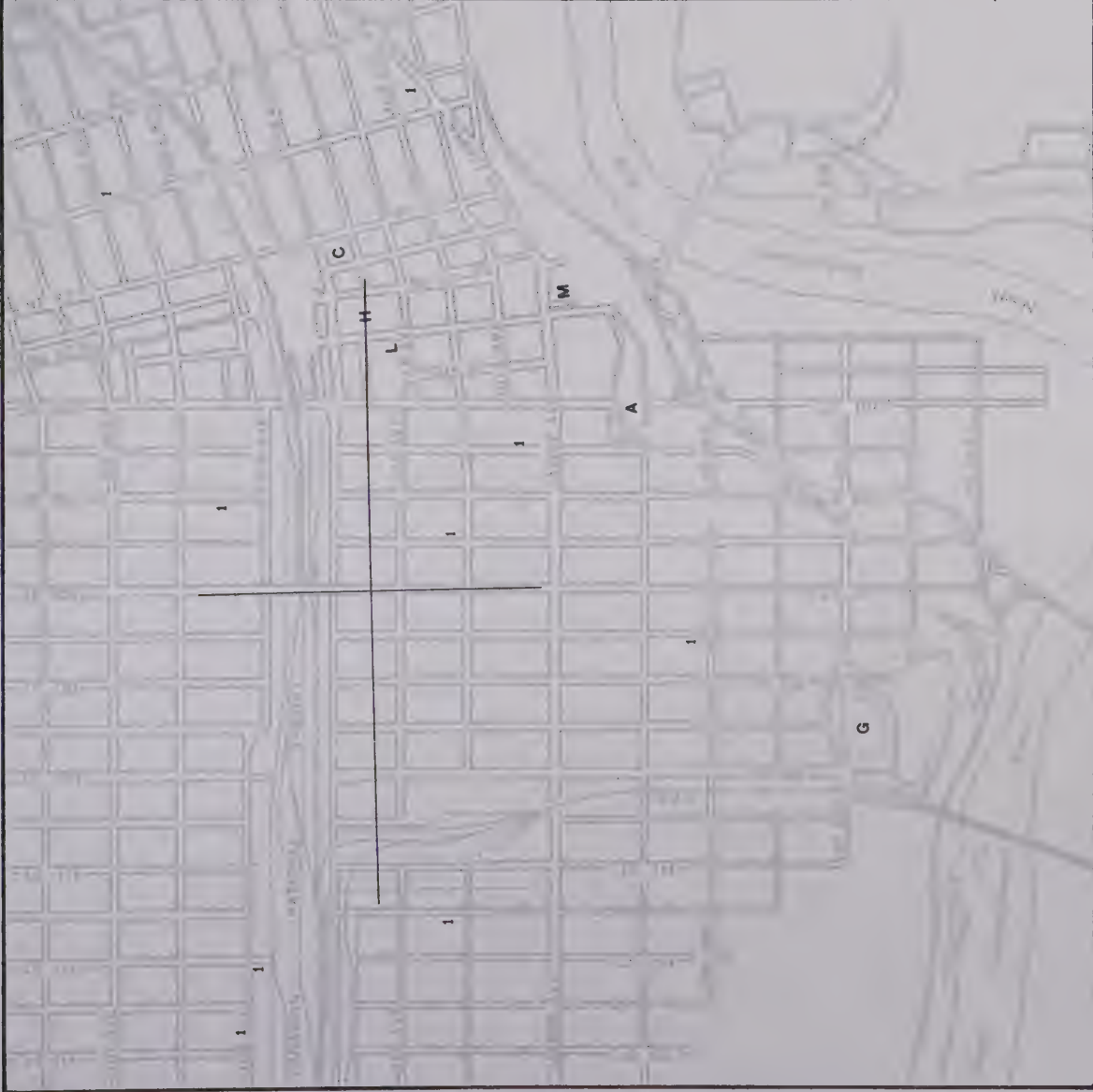
- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 176







## 1969-70

**EDMONTON**  
**CENTRAL AREA EXCLUDED**

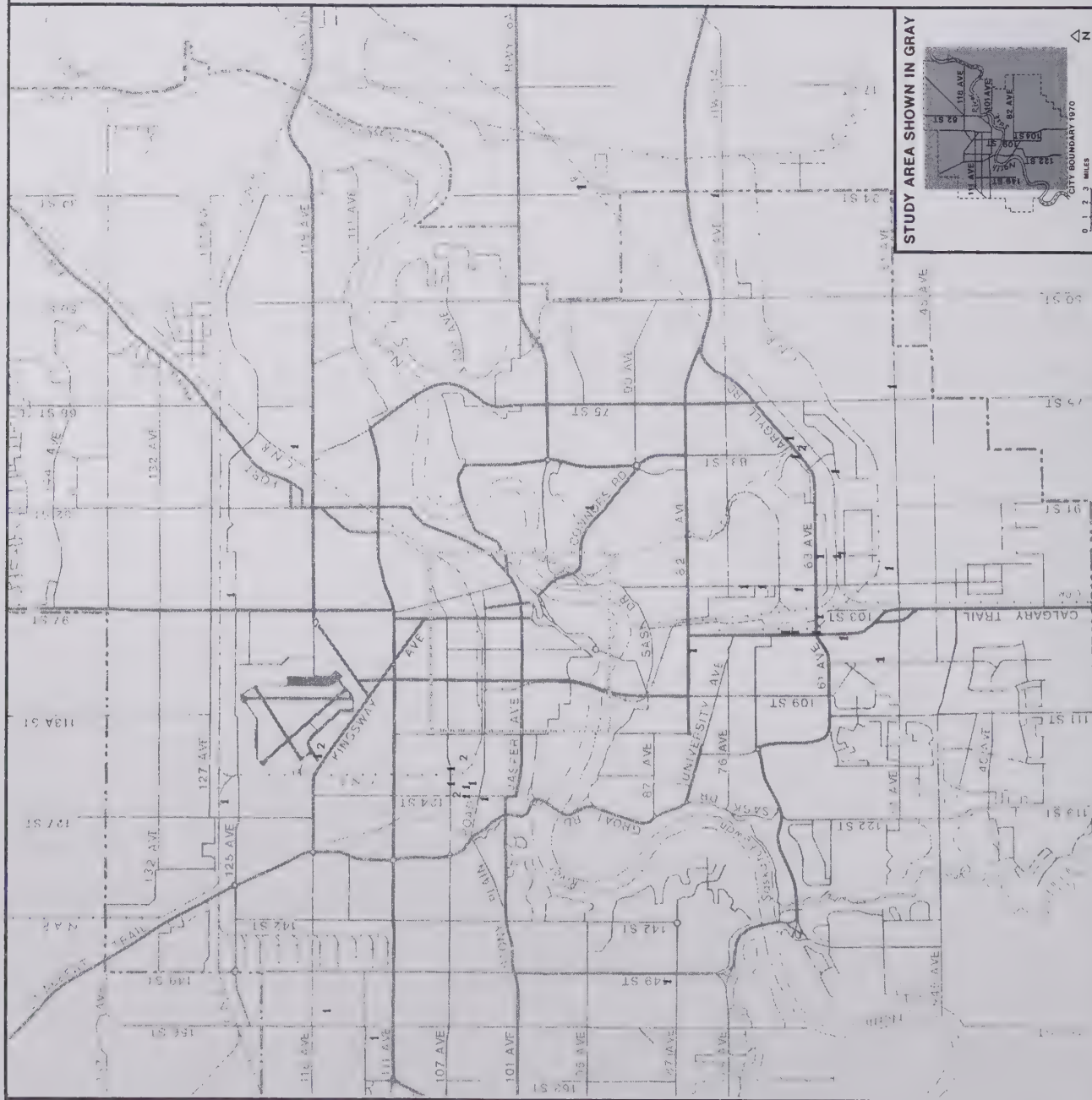
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

## CENTRAL AREA

A vertical scale bar labeled "FEET" with markings from 0 to 12,000 in increments of 2,000. The markings are: 0, 2000, 4000, 6000, 8000, 10000, 12000.

SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 177



# ENGINEERS, DESIGNERS, CONSTRUCTORS, FABRICATORS

1969-70

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 178





ENGINEERS,  
DESIGNERS,  
CONSTRUCTORS,  
FABRICATORS

CENTRAL EDMONTON

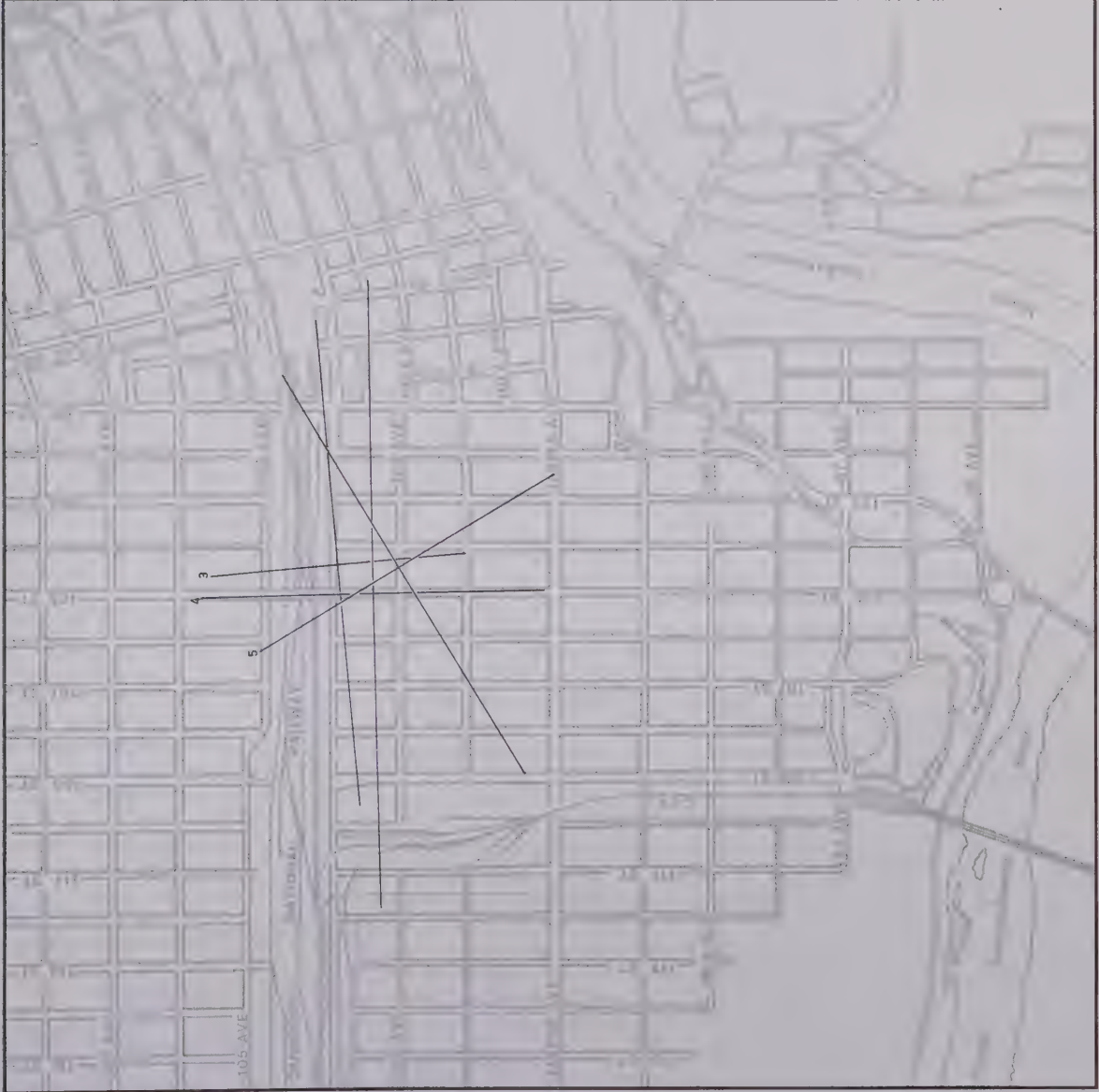
STANDARD DISTANCE  
PARAMETER

1	1950-51
2	1954-55
3	1959-60
4	1964-65
5	1969-70



G. H. Z.

Figure 179







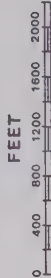


# GEOPHYSICAL AND EXPLORATION DRILLING CONTRACTORS 1950-51 CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
 AND FREQUENCY OF OCCURRENCE.

——— STANDARD DISTANCE  
 PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
 G. H. Z.

Figure 181





# GEOPHYSICAL AND EXPLORATION DRILLING CONTRACTORS 1954-55

EDMONTON  
CENTRAL AREA EXCLUDED

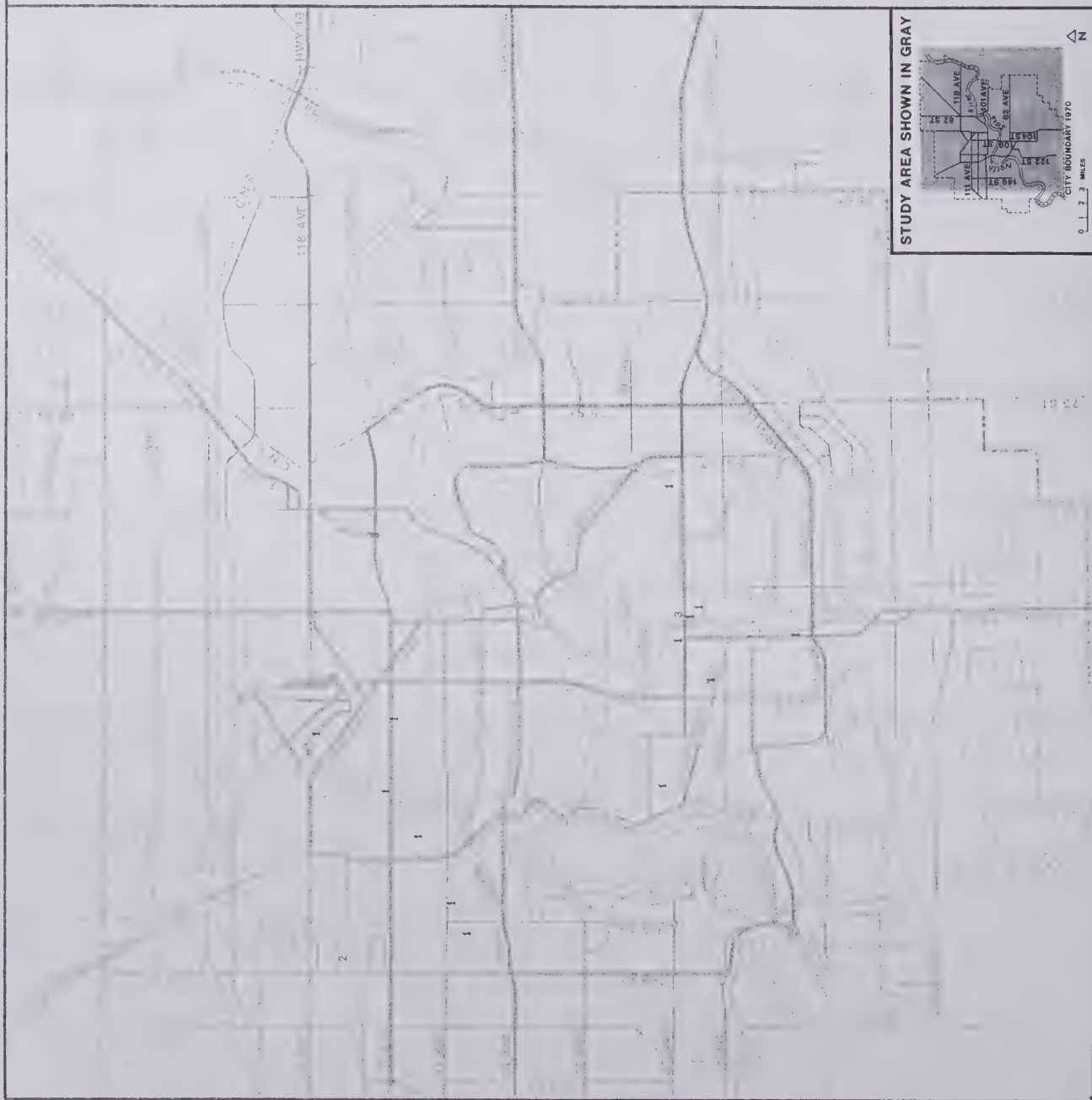
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

————— CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 182



**GEOPHYSICAL  
AND EXPLORATION  
DRILLING  
CONTRACTORS  
1954-55  
CENTRAL EDMONTON**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

PARAMETER	STANDARD DISTANCE
1. $\bar{X}$	1.0
2. $\bar{Y}$	1.0
3. $\bar{Z}$	1.0
4. $\bar{W}$	1.0
5. $\bar{V}$	1.0
6. $\bar{U}$	1.0
7. $\bar{T}$	1.0
8. $\bar{S}$	1.0
9. $\bar{R}$	1.0
10. $\bar{Q}$	1.0
11. $\bar{P}$	1.0
12. $\bar{O}$	1.0
13. $\bar{N}$	1.0
14. $\bar{M}$	1.0
15. $\bar{L}$	1.0
16. $\bar{K}$	1.0
17. $\bar{J}$	1.0
18. $\bar{I}$	1.0
19. $\bar{H}$	1.0
20. $\bar{G}$	1.0
21. $\bar{F}$	1.0
22. $\bar{E}$	1.0
23. $\bar{D}$	1.0
24. $\bar{C}$	1.0
25. $\bar{B}$	1.0
26. $\bar{A}$	1.0

- |   |                              |
|---|------------------------------|
| H | City Hall                    |
| L | Land Titles Office           |
| C | Court House                  |
| G | Alberta Government Buildings |
| M | Macdonald Hotel              |
| A | Chateau Lacombe Hotel        |

A vertical scale bar labeled "FEET" with markings at 0, 400, 800, 1200, 1600, and 2000.

SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.







# GEOPHYSICAL AND EXPLORATION DRILLING CONTRACTORS 1959-60

EDMONTON  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 184



# GEOPHYSICAL AND EXPLORATION DRILLING CONTRACTORS 1959-60 CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
 AND FREQUENCY OF OCCURRENCE.

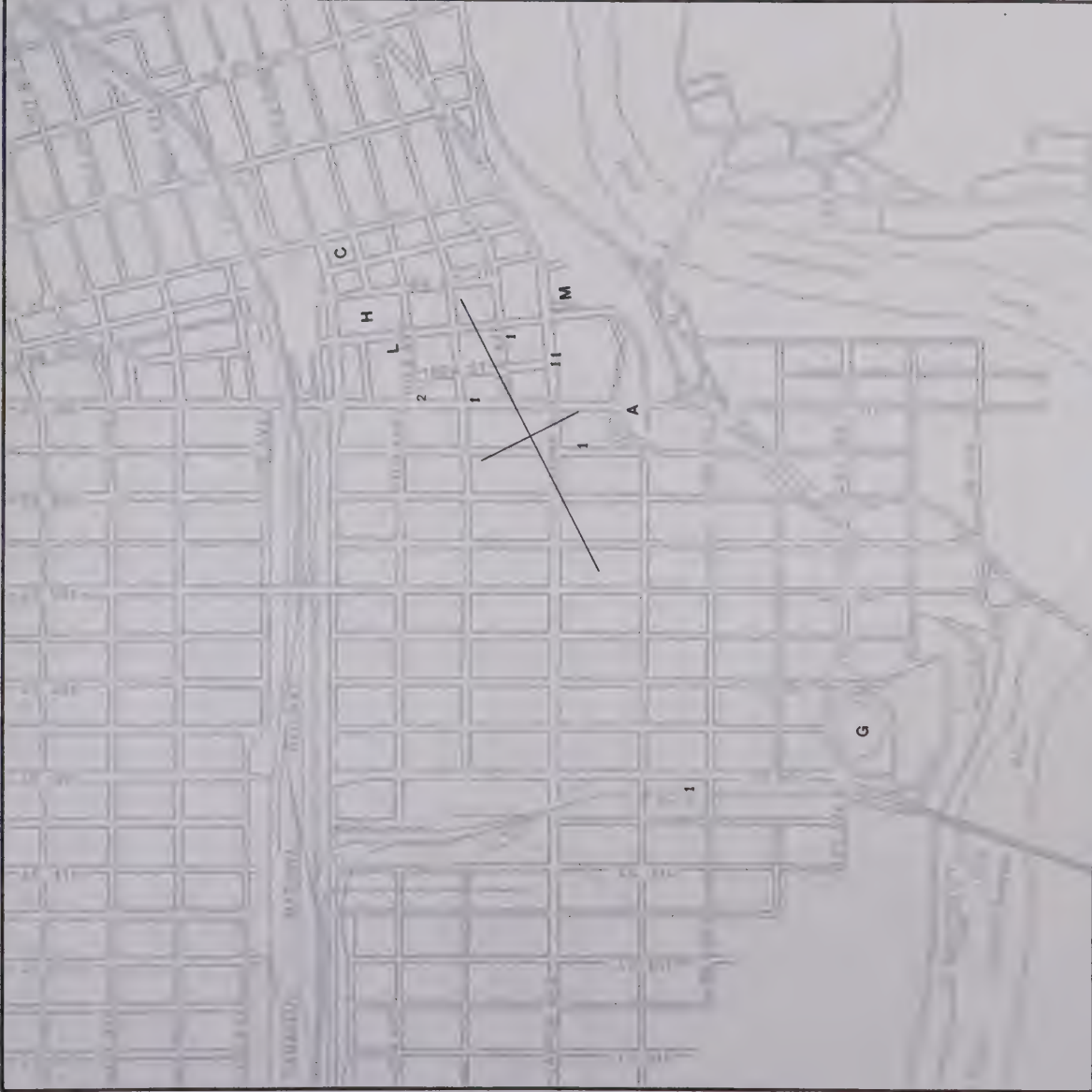
—+— STANDARD DISTANCE  
 PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
 G. H. Z.

Figure 185







# **GEOPHYSICAL AND EXPLORATION DRILLING CONTRACTORS 1964-65**

**EDMONTON  
CENTRAL AREA EXCLUDED**

**NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.**

**————— CENTRAL AREA**



**SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.**

**Figure 186**



# GEOPHYSICAL AND EXPLORATION DRILLING CONTRACTORS

1964-65

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 187







A map of the study area in Gray, showing streets and the city boundary in 1970. The map includes a north arrow and a scale bar in miles (0 to 2). The streets shown are 11th Ave, 8th Ave, 10th Ave, 12th Ave, 14th Ave, 16th Ave, 18th Ave, 20th Ave, 22nd Ave, 24th Ave, 26th Ave, 28th Ave, 30th Ave, 32nd Ave, 34th Ave, 36th Ave, 38th Ave, 40th Ave, 42nd Ave, 44th Ave, 46th Ave, 48th Ave, 50th Ave, 52nd Ave, 54th Ave, 56th Ave, 58th Ave, 60th Ave, 62nd Ave, 64th Ave, 66th Ave, 68th Ave, 70th Ave, 72nd Ave, 74th Ave, 76th Ave, 78th Ave, 80th Ave, 82nd Ave, 84th Ave, 86th Ave, 88th Ave, 90th Ave, 92nd Ave, 94th Ave, 96th Ave, 98th Ave, 100th Ave. The city boundary in 1970 is shown as a dashed line. The map also shows the location of the study area relative to the city of Gray.

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

## CENTRAL AREA

FEET

0 2000 4000 6000 8000 10000 12000

SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

# GEOPHYSICAL AND EXPLORATION DRILLING CONTRACTORS CENTRAL EDMONTON

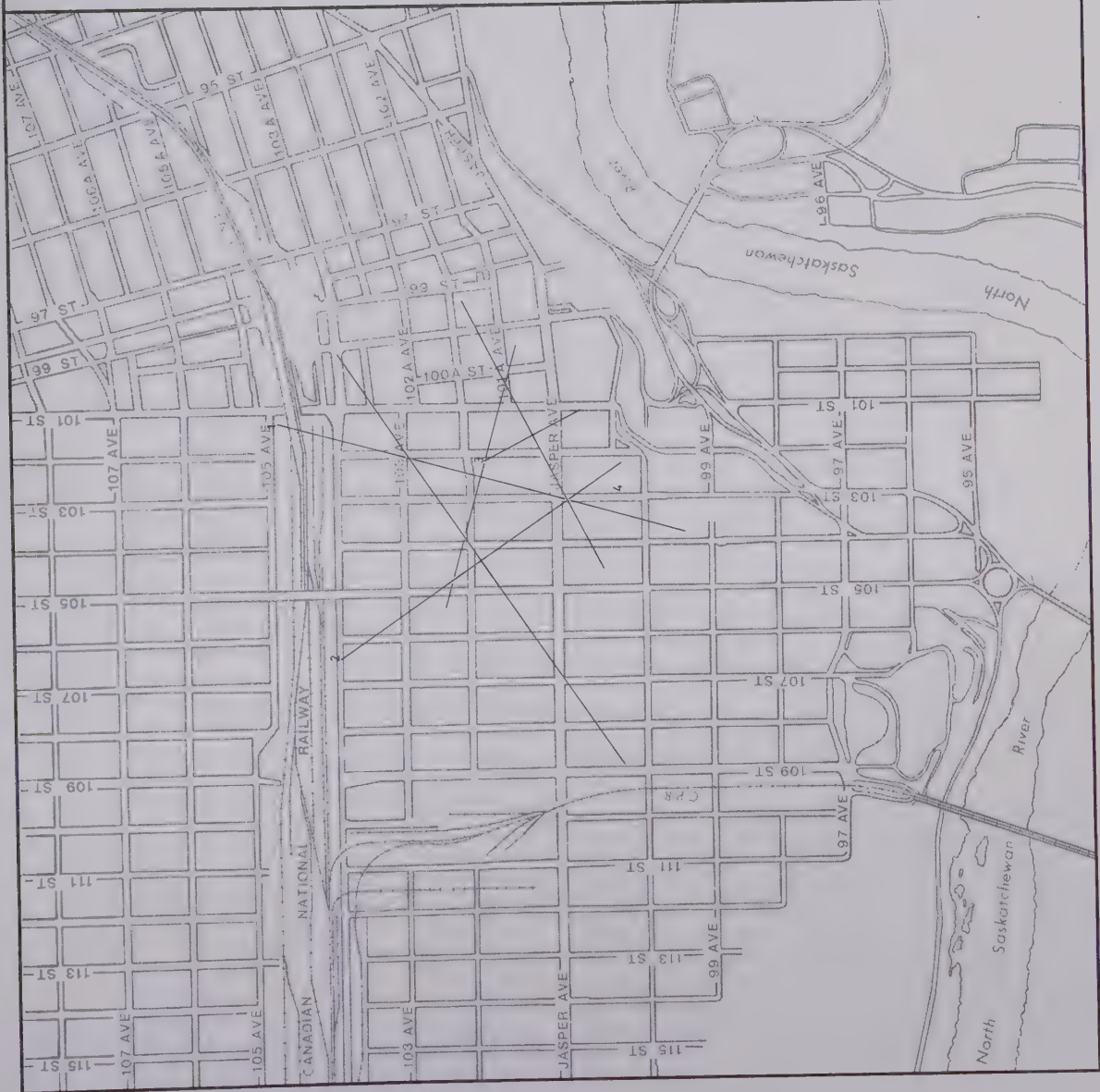
## STANDARD DISTANCE PARAMETER

- |   |         |
|---|---------|
| 1 | 1950-51 |
| 2 | 1954-55 |
| 3 | 1959-60 |
| 4 | 1964-65 |
| 5 | 1969-70 |



G. H. Z.

Figure 189







1954-55

**EDMONTON**  
**CENTRAL AREA EXCLUDED**

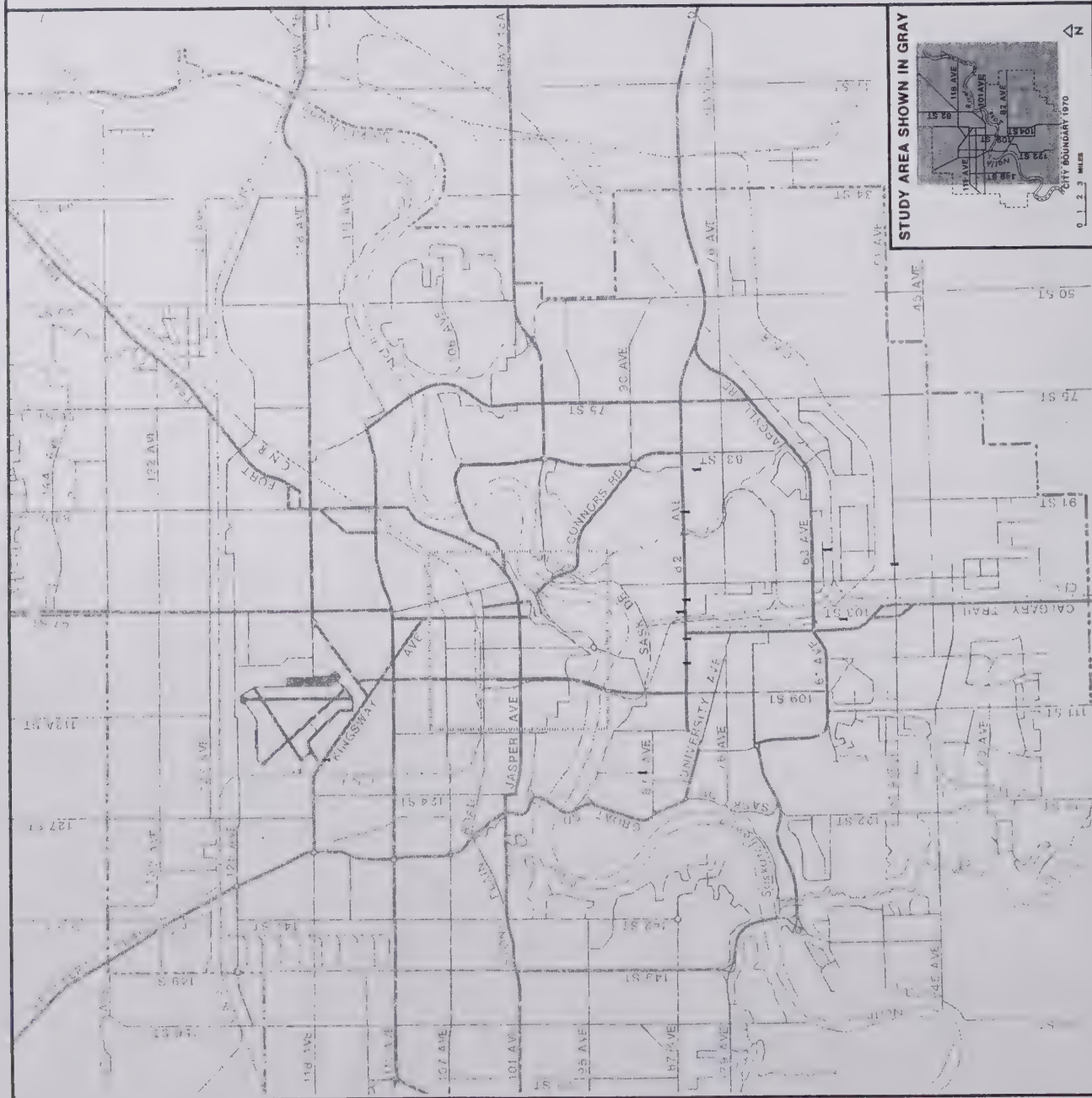
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA

A vertical scale bar labeled "FEET" with markings at 0, 2000, 4000, 6000, 8000, 10000, and 12000.

SOURCE : NICKLE'S CANADIAN OIL REGISTER

Figure 190



# OILWELL SERVICING 1954-55

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 191







## 1959-60

**EDMONTON  
CENTRAL AREA EXCLUDED**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

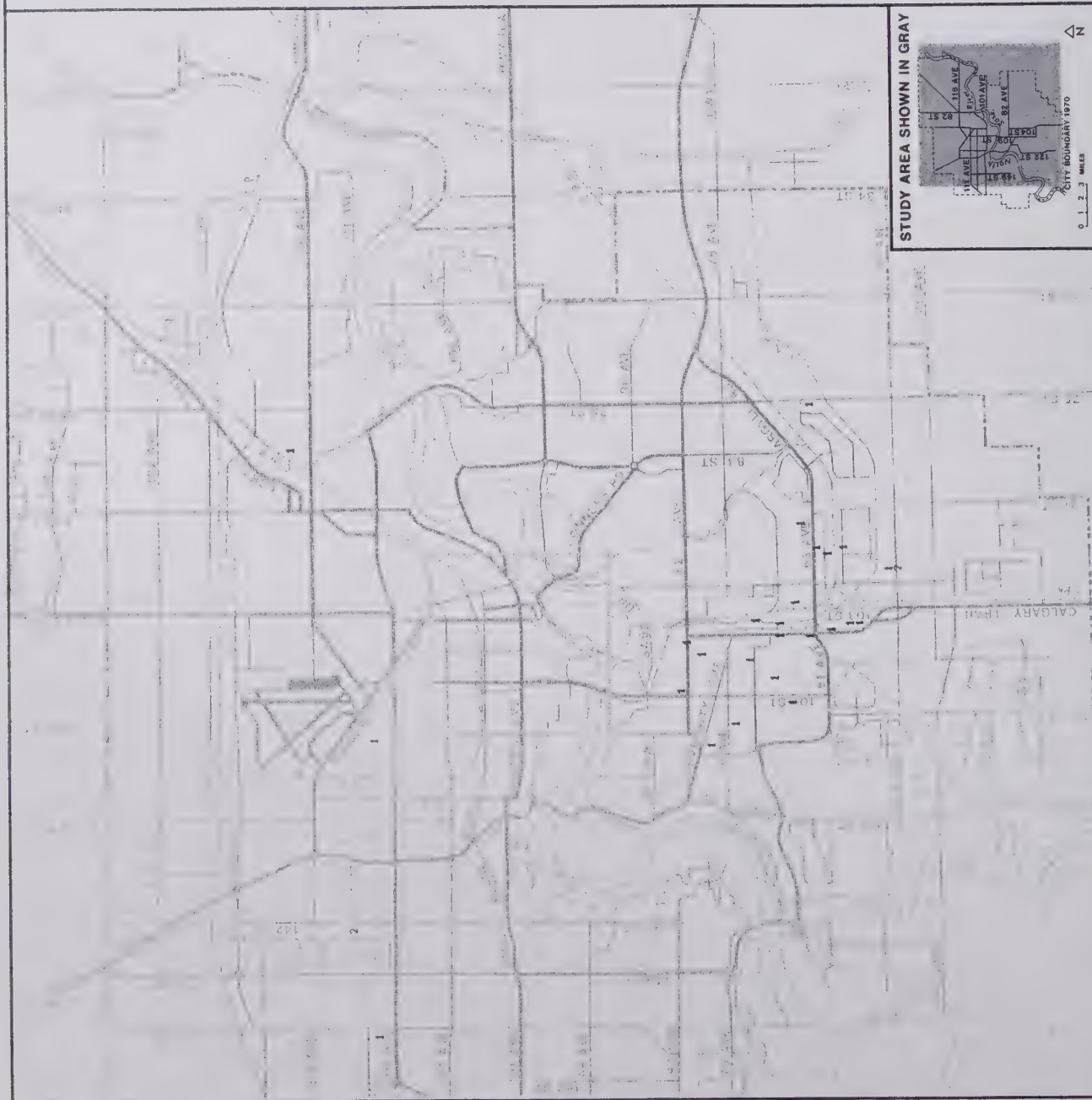
CENTRAL AREA



**SOURCE : NICKLE'S CANADIAN OIL REGISTER**

G. H. Z.

Figure 192



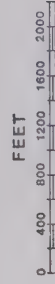
**OILWELL  
SERVICING  
1959-60**

**CENTRAL EDMONTON**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

—+— STANDARD DISTANCE  
PARAMETER

- |   |                              |
|---|------------------------------|
| H | City Hall                    |
| L | Land Titles Office           |
| C | Court House                  |
| G | Alberta Government Buildings |
| M | Macdonald Hotel              |
| A | Chateau Lacombe Hotel        |



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 193







# OILWELL SERVICING

1964-65

EDMONTON  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

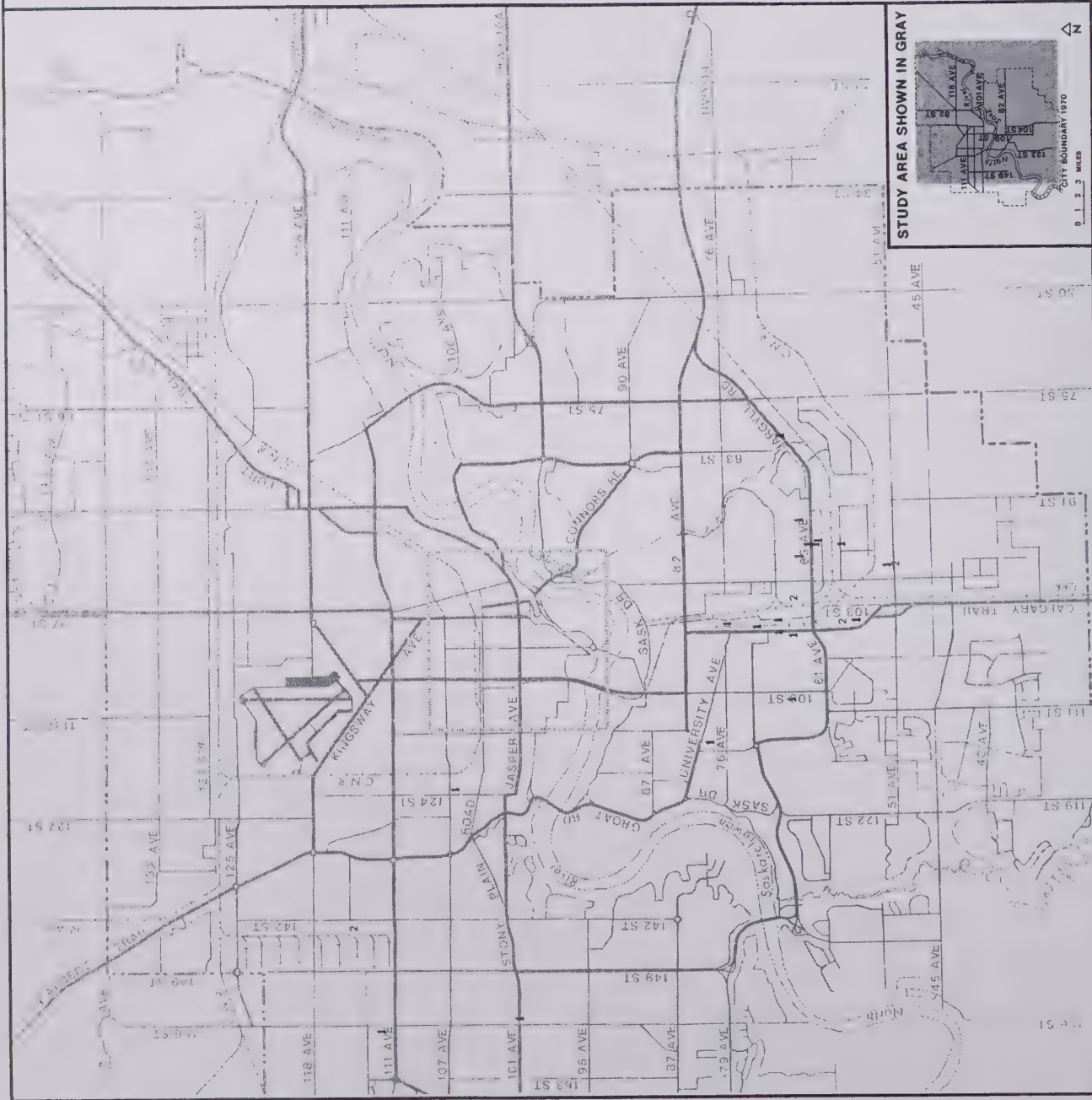
————— CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 194



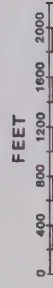
# OILWELL SERVICING 1964-65

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 195









# OILWELL SERVICING 1969-70

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 197



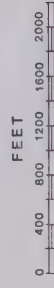


# OILWELL SERVICING

## CENTRAL EDMONTON

### STANDARD DISTANCE PARAMETER

1	1950-51
2	1954-55
3	1959-60
4	1964-65
5	1969-70



G. H. Z.

Figure 198







# PIPELINE COMPANIES, POWER DISTRIBUTORS

1950-51

EDMONTON  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 199



# PIPELINE COMPANIES, POWER DISTRIBUTORS

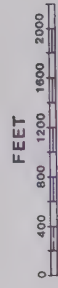
1950-51

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 200





# PIPELINE COMPANIES, POWER DISTRIBUTORS

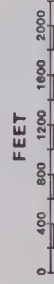
1954-55

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 201







1959-60

**EDMONTON  
CENTRAL AREA EXCLUDED**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER

Figure 202



# PIPELINE COMPANIES, POWER DISTRIBUTORS

1959-60

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 203







# PIPELINE COMPANIES, POWER DISTRIBUTORS

1964-65

EDMONTON  
CENTRAL AREA EXCLUDED

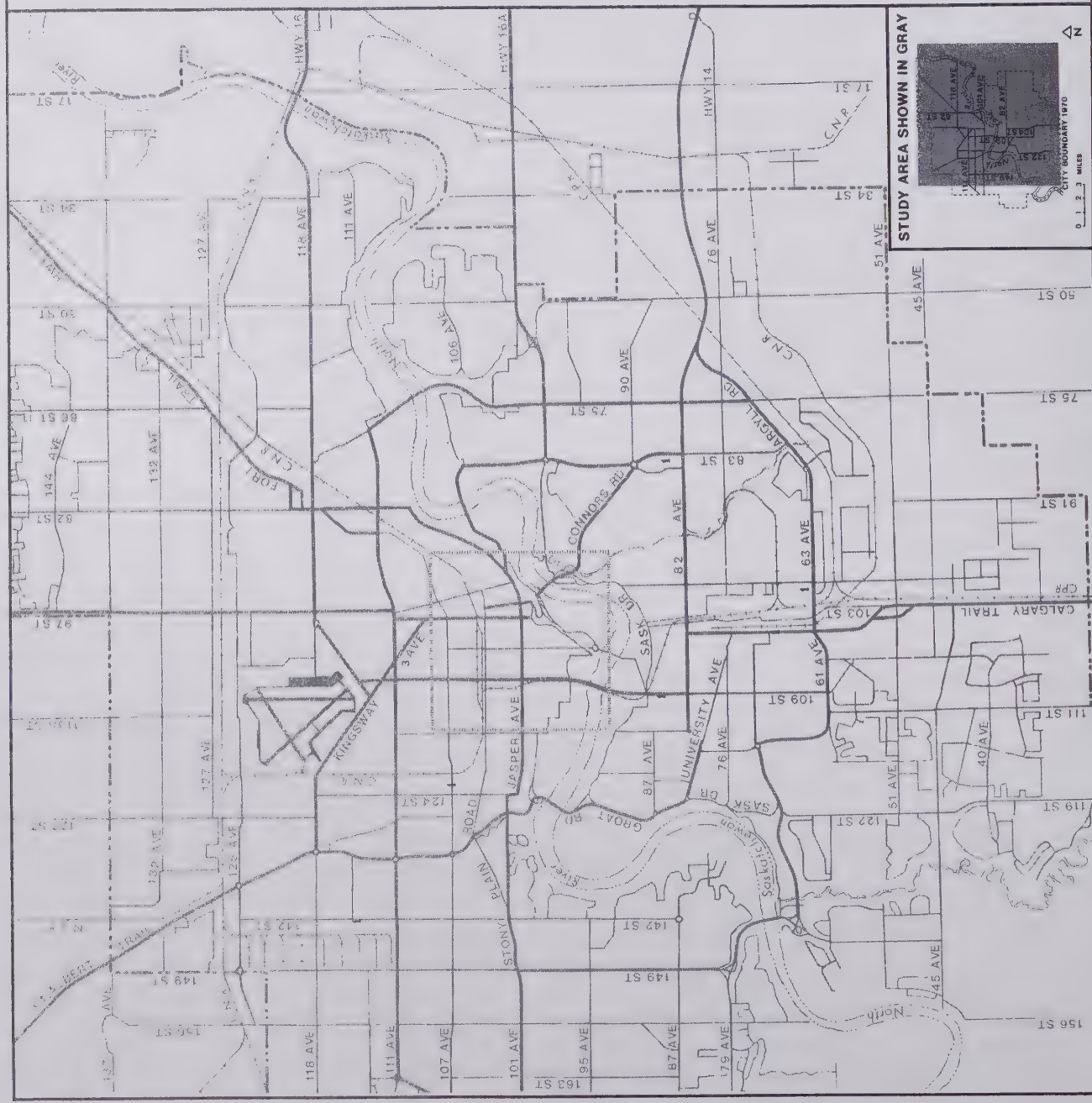
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

— CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 204



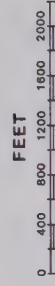
# PIPELINE COMPANIES, POWER DISTRIBUTORS 1964-65

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

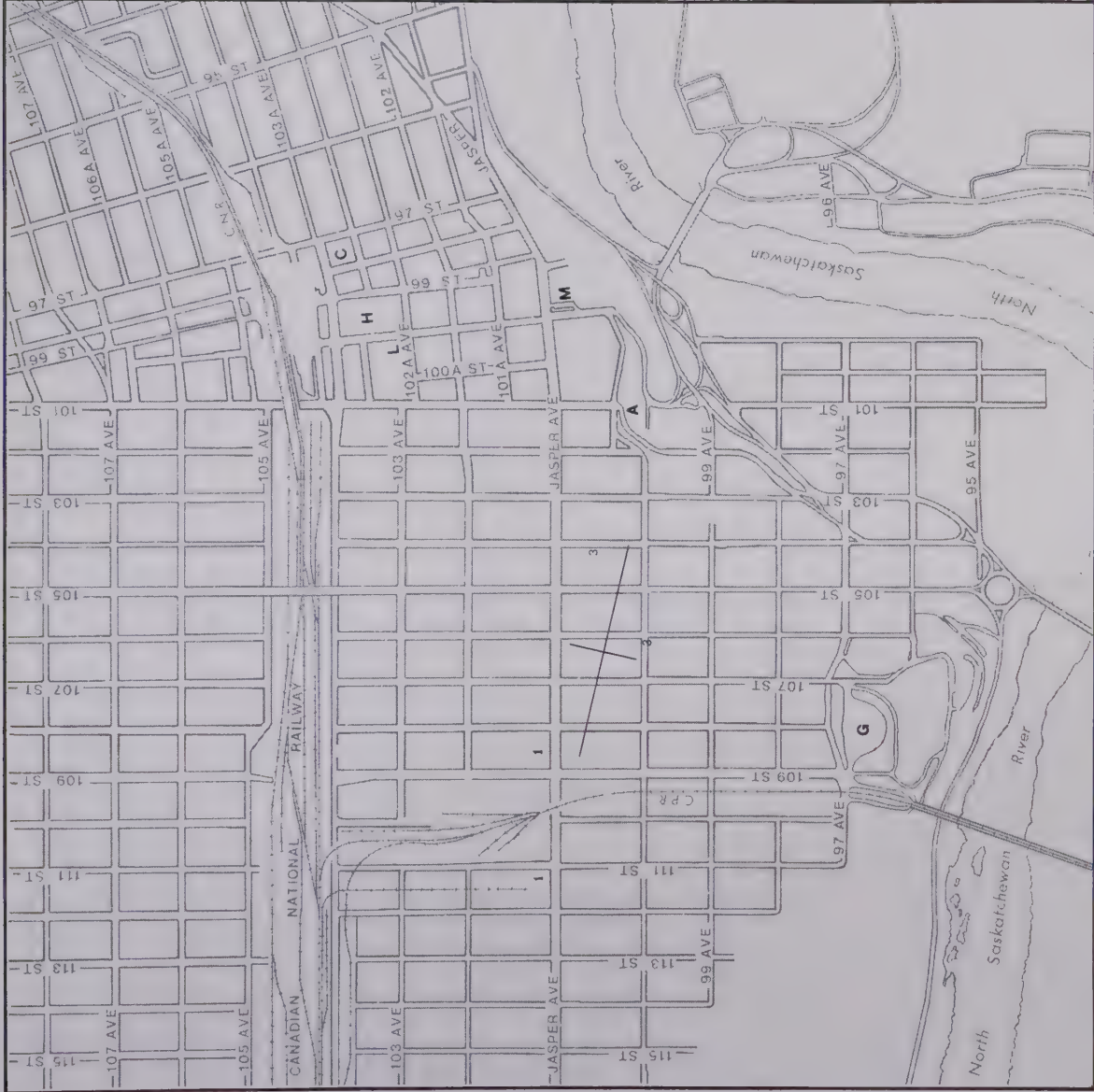
- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 205







# PIPELINE COMPANIES, POWER DISTRIBUTORS

1969-70

EDMONTON  
CENTRAL AREA EXCLUDED

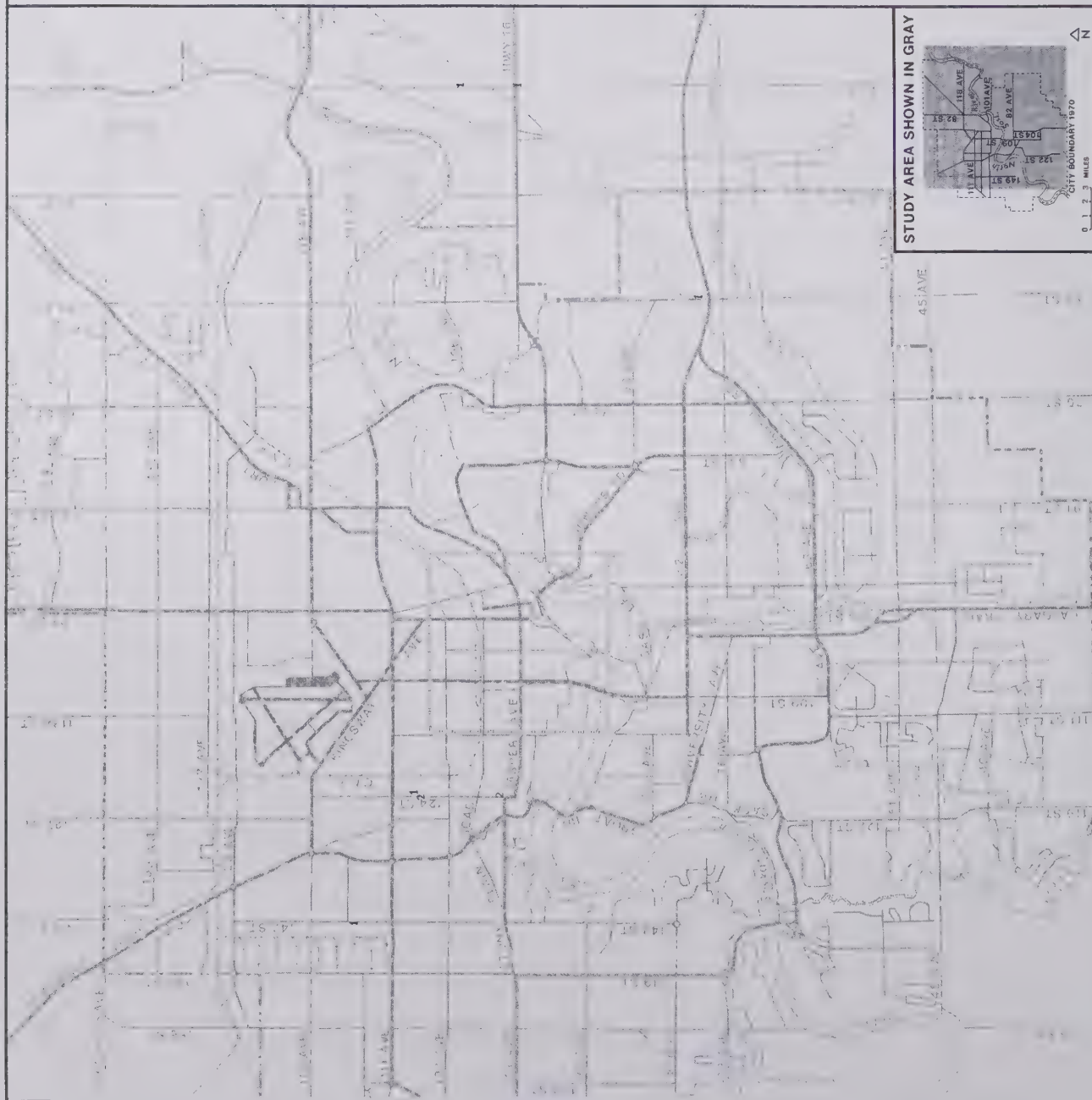
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA

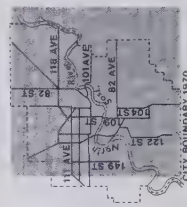


SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 206



STUDY AREA SHOWN IN GRAY



CITY BOUNDARY 1970  
0 1 2 3 MILES

# PIPELINE COMPANIES, POWER DISTRIBUTORS

1969-70

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE: NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 207





PIPELINE  
COMPANIES,  
POWER  
DISTRIBUTORS

CENTRAL EDMONTON

STANDARD DISTANCE  
PARAMETER

1	1950-51
2	1954-55
3	1959-60
4	1964-65
5	1969-70



G. H. Z.

Figure 208







**EDMONTON**  
**CENTRAL AREA EXCLUDED**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

**CENTRAL AREA**

A vertical scale bar labeled "FEET" with markings from 0 to 12,000 in increments of 2,000.

SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 209

# REFINERS, PROCESSORS, MARKETERS, PLANT OPERATORS

1950-51

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 210







**EDMONTON**  
**CENTRAL AREA EXCLUDED**

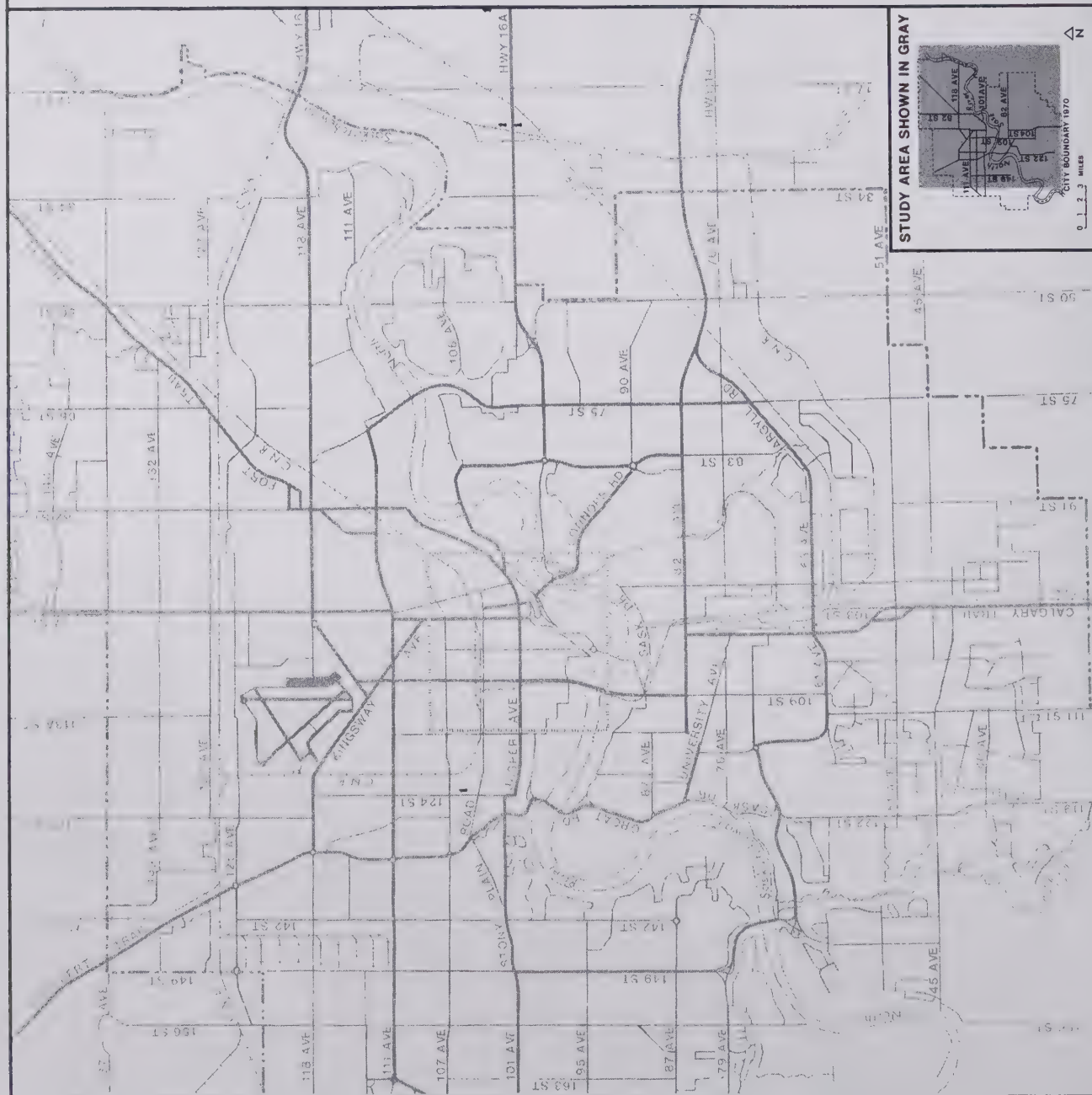
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

**CENTRAL AREA**

**SOURCE : NICKLE'S CANADIAN OIL REGISTER**

G. H. Z.

**Figure 211**

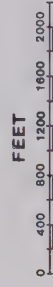


# REFINERS, PROCESSORS, MARKETERS, PLANT OPERATORS 1954-55 CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

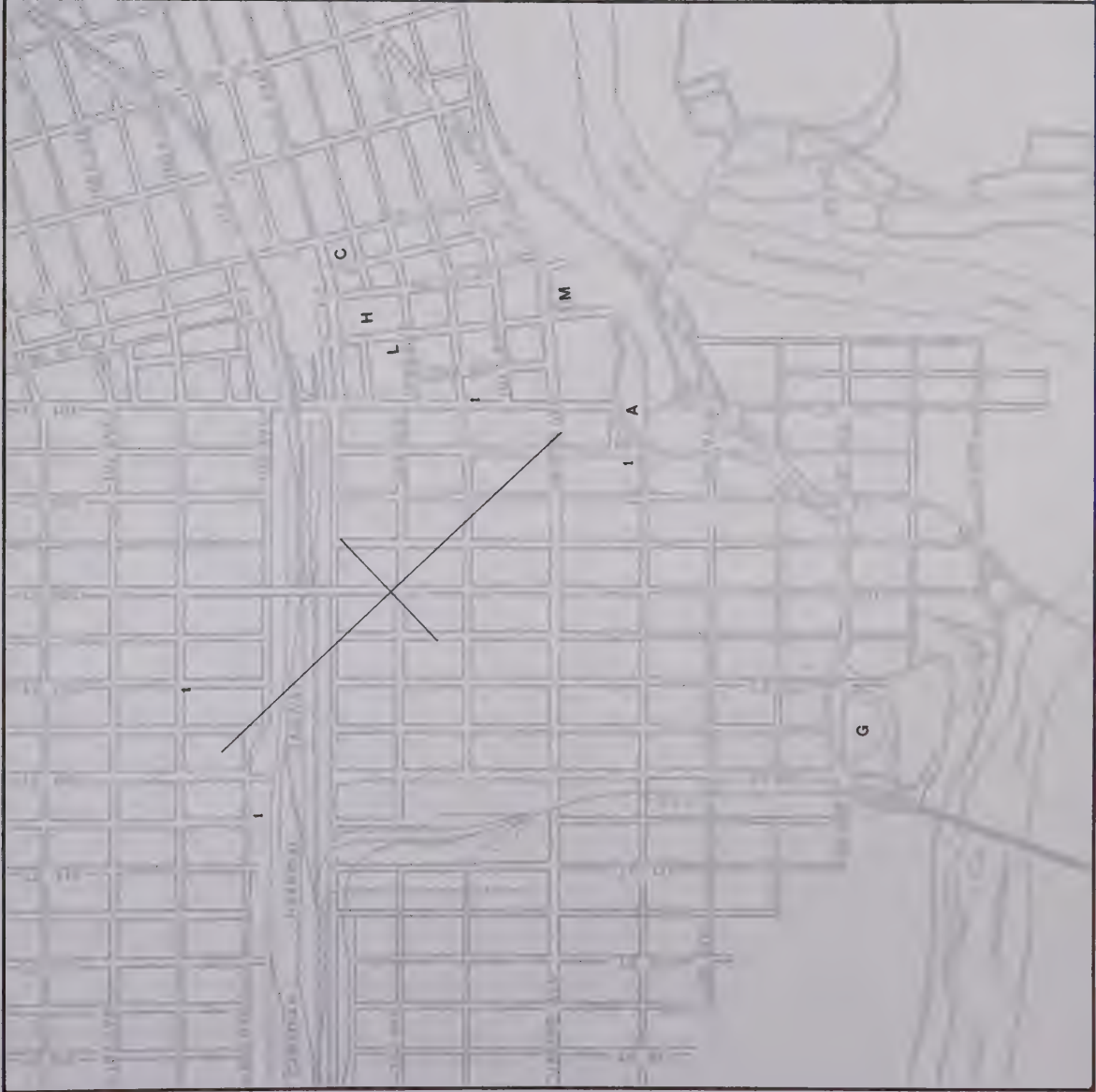
- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 212







**EDMONTON  
CENTRAL AREA EXCLUDED**

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA

A vertical scale bar labeled "FEET" with markings at 0, 2000, 4000, 6000, 8000, 10000, and 12000.

**SOURCE : NICKLE'S CANADIAN OIL REGISTER**

G. H. Z.

Figure 213



# REFINERS, PROCESSORS, MARKETERS, PLANT OPERATORS

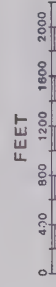
1959-60

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

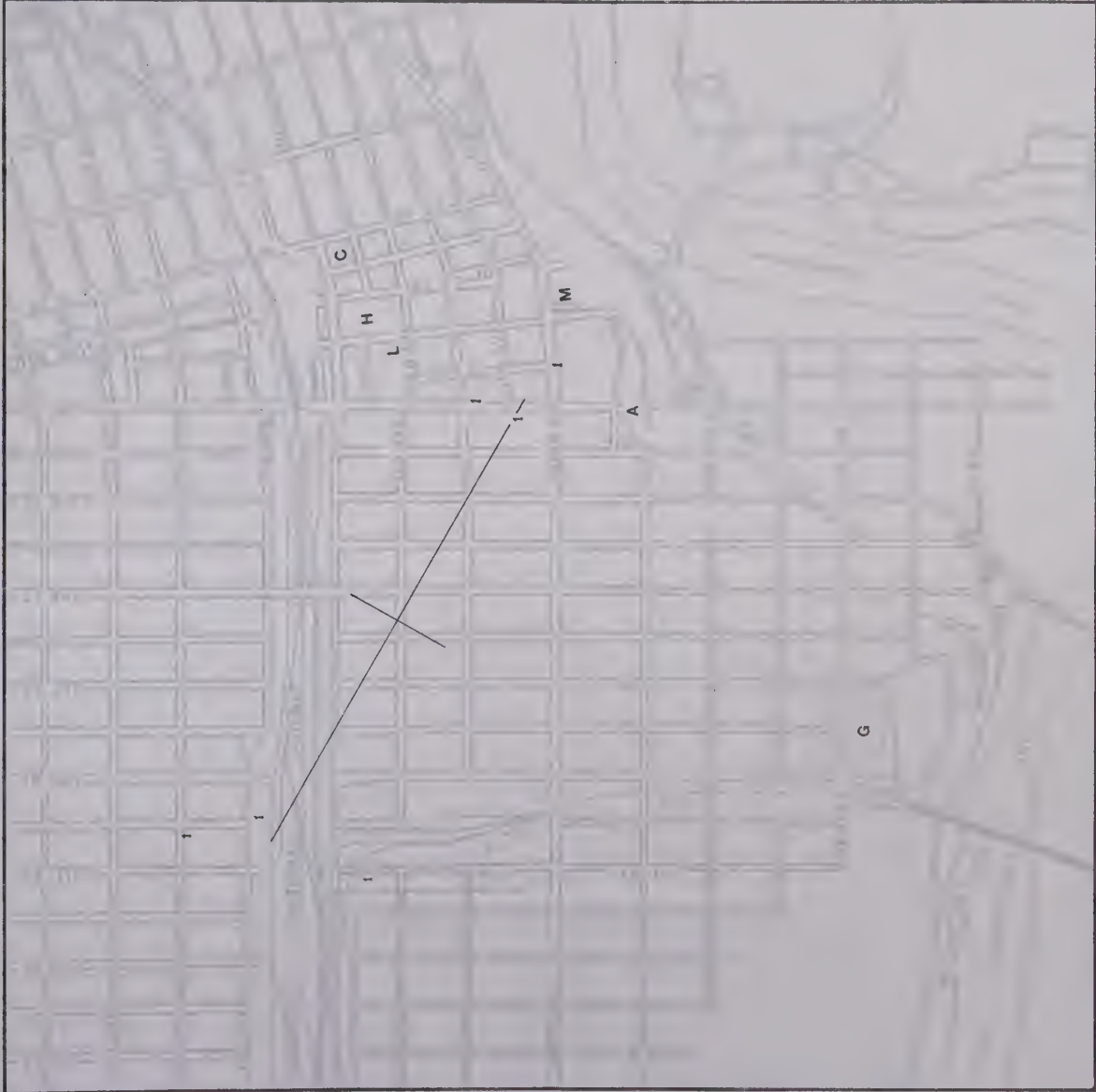
- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 214







# REFINERS, PROCESSORS, MARKETERS, PLANT OPERATORS

1964-65

EDMONTON  
CENTRAL AREA EXCLUDED

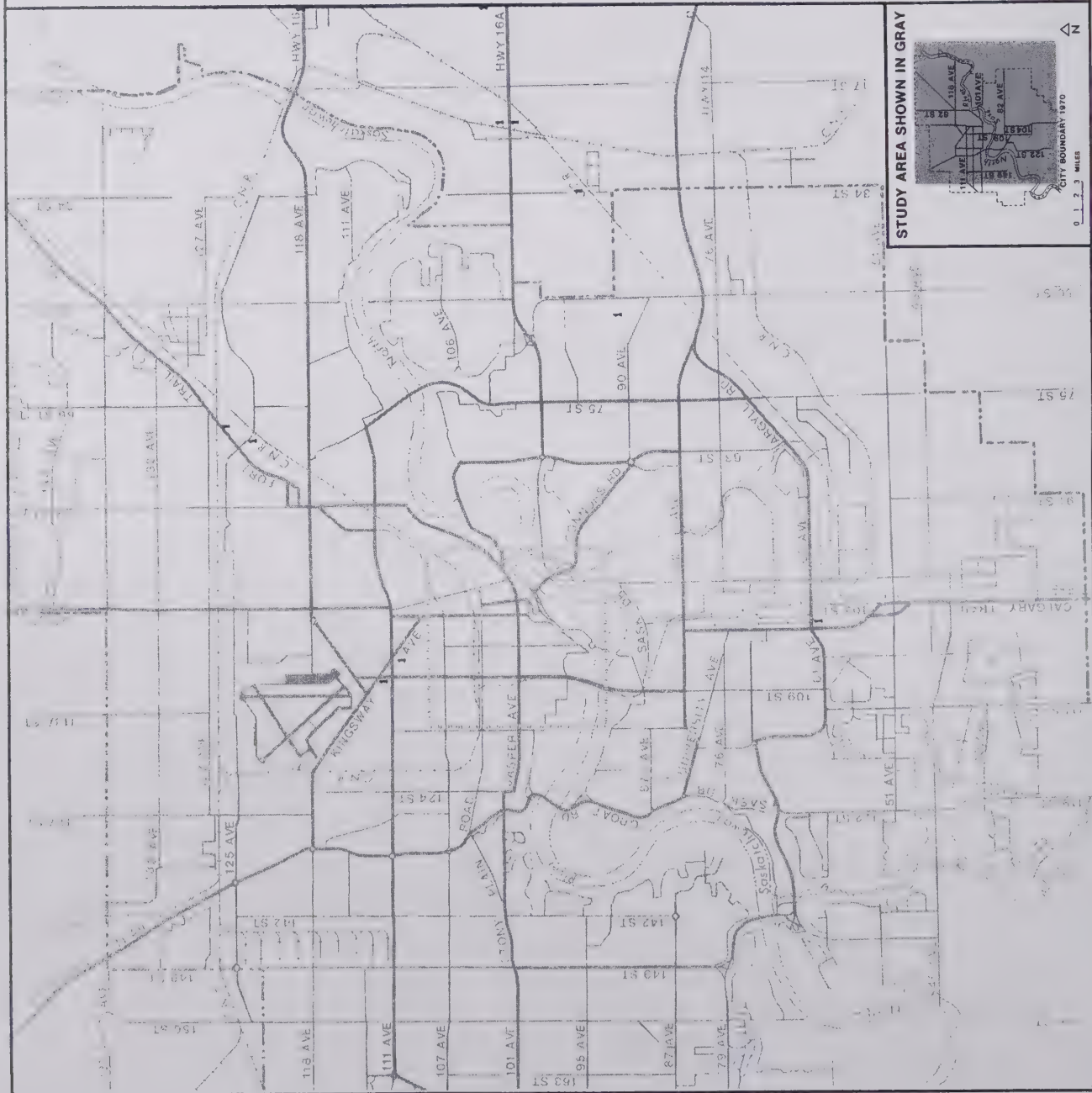
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 2.15



# REFINERS, PROCESSORS, MARKETERS, PLANT OPERATORS 1964-65 CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 216







# REFINERS, PROCESSORS, MARKETERS, PLANT OPERATORS

1969-70

EDMONTON  
CENTRAL AREA EXCLUDED

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 217



# REFINERS, PROCESSORS, MARKETERS, PLANT OPERATORS 1969-70

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 218



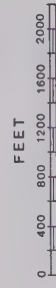


REFINERS,  
PROCESSORS,  
MARKETERS,  
PLANT OPERATORS

CENTRAL EDMONTON

STANDARD DISTANCE  
PARAMETER

1	1950-51
2	1954-55
3	1959-60
4	1964-65
5	1969-70



G. H. Z.

Figure 219





# TRANSPORTATION, OILFIELD CONSTRUCTION 1964-65

EDMONTON  
CENTRAL AREA EXCLUDED

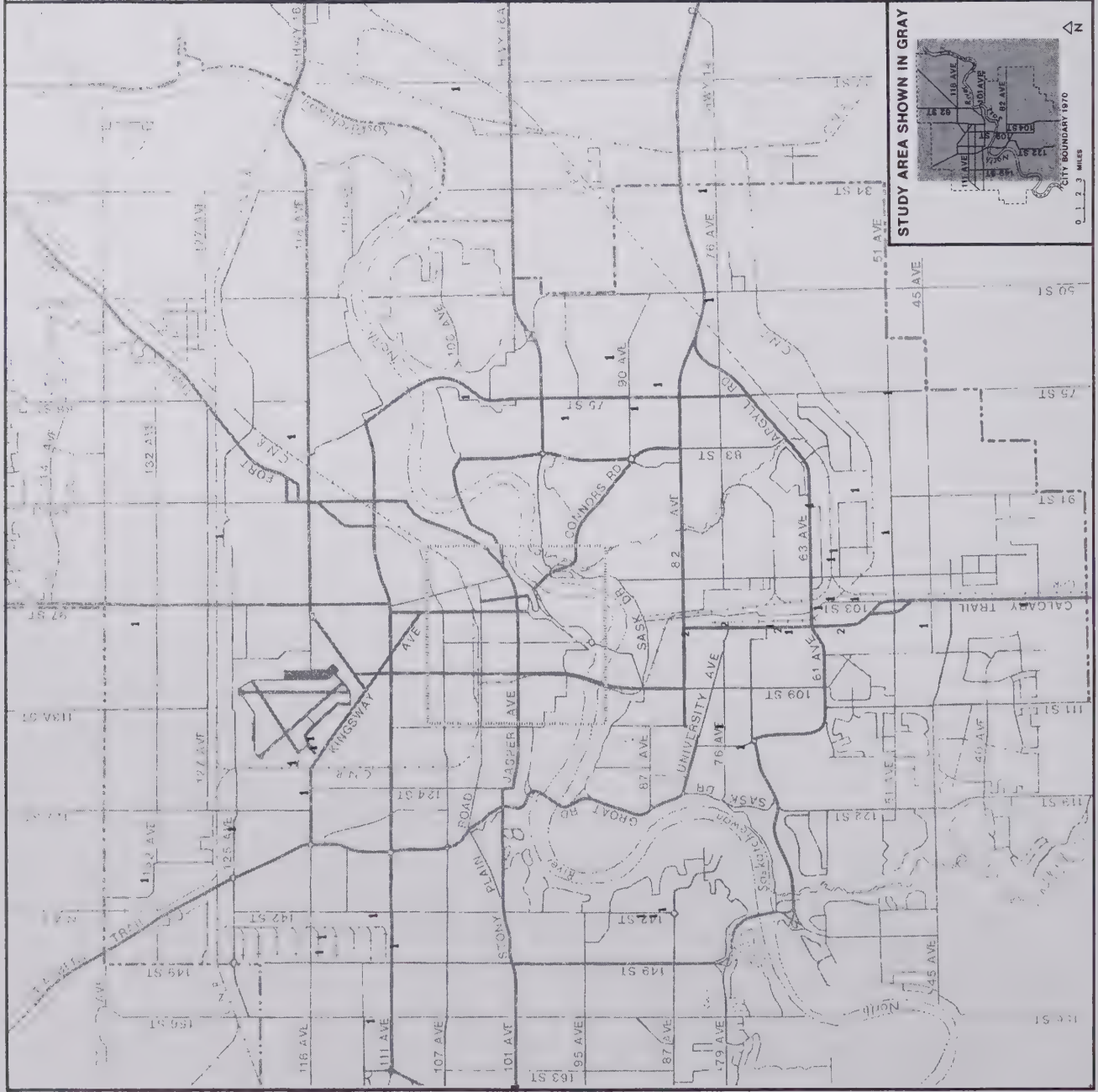
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

————— CENTRAL AREA



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 220



# TRANSPORTATION, OILFIELD CONSTRUCTION 1964-65 CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER

G. H. Z.

Figure 221







**EDMONTON**  
**CENTRAL AREA EXCLUDED**

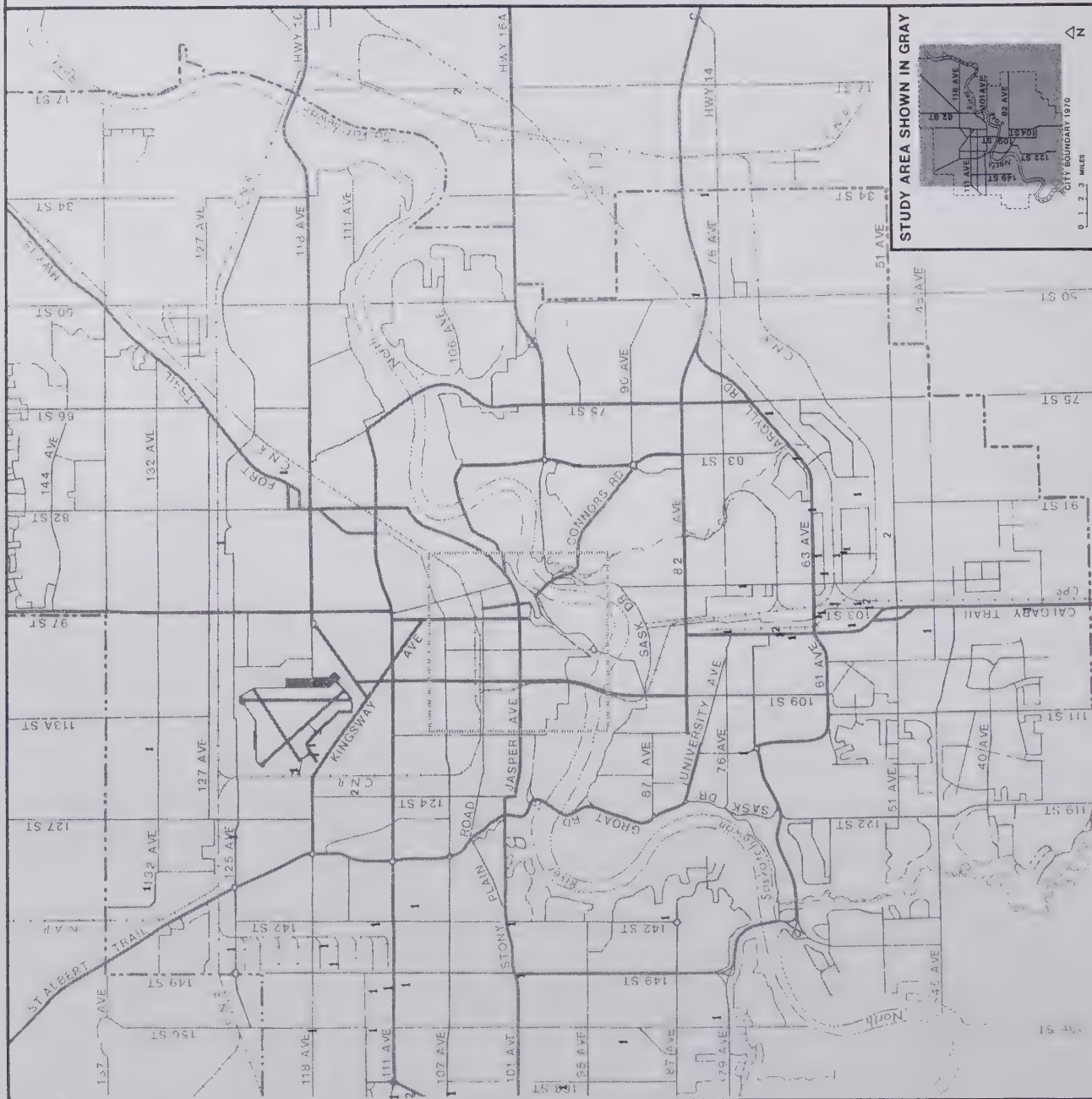
NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.  
EACH ONE IS LESS THAN TEN.

CENTRAL AREA

A vertical scale labeled "FEET" with major tick marks every 2,000 units, ranging from 0 to 12,000. The scale is oriented vertically with 0 at the bottom and 12,000 at the top.

SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 222



# TRANSPORTATION, OILFIELD CONSTRUCTION

1969-70

## CENTRAL EDMONTON

NUMBER INDICATES LOCATION  
AND FREQUENCY OF OCCURRENCE.

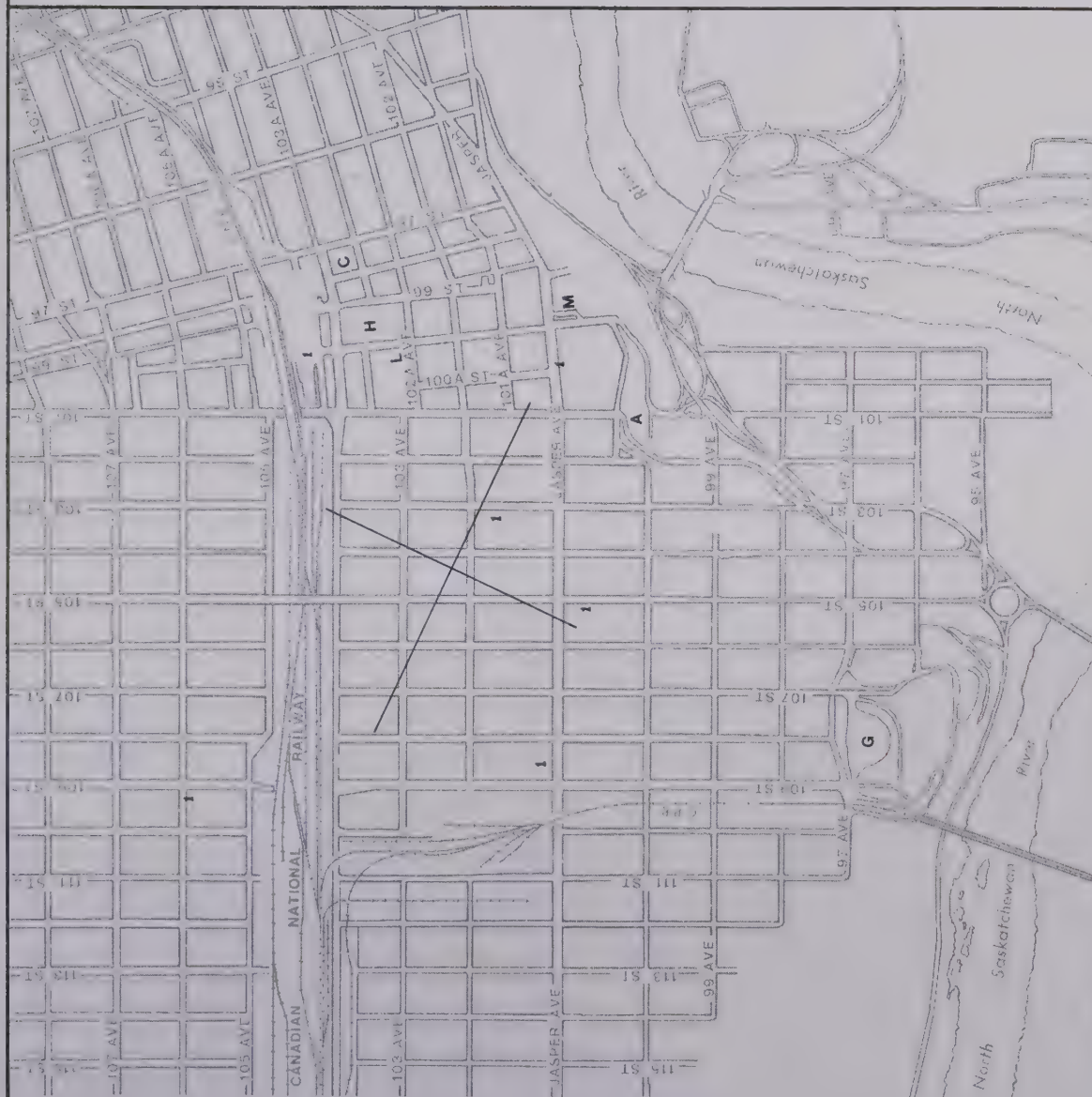
— STANDARD DISTANCE  
PARAMETER

- H City Hall
- L Land Titles Office
- C Court House
- G Alberta Government Buildings
- M Macdonald Hotel
- A Chateau Lacombe Hotel



SOURCE : NICKLE'S CANADIAN OIL REGISTER  
G. H. Z.

Figure 223



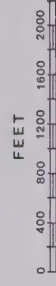


# TRANSPORTATION, OILFIELD CONSTRUCTION

## CENTRAL EDMONTON

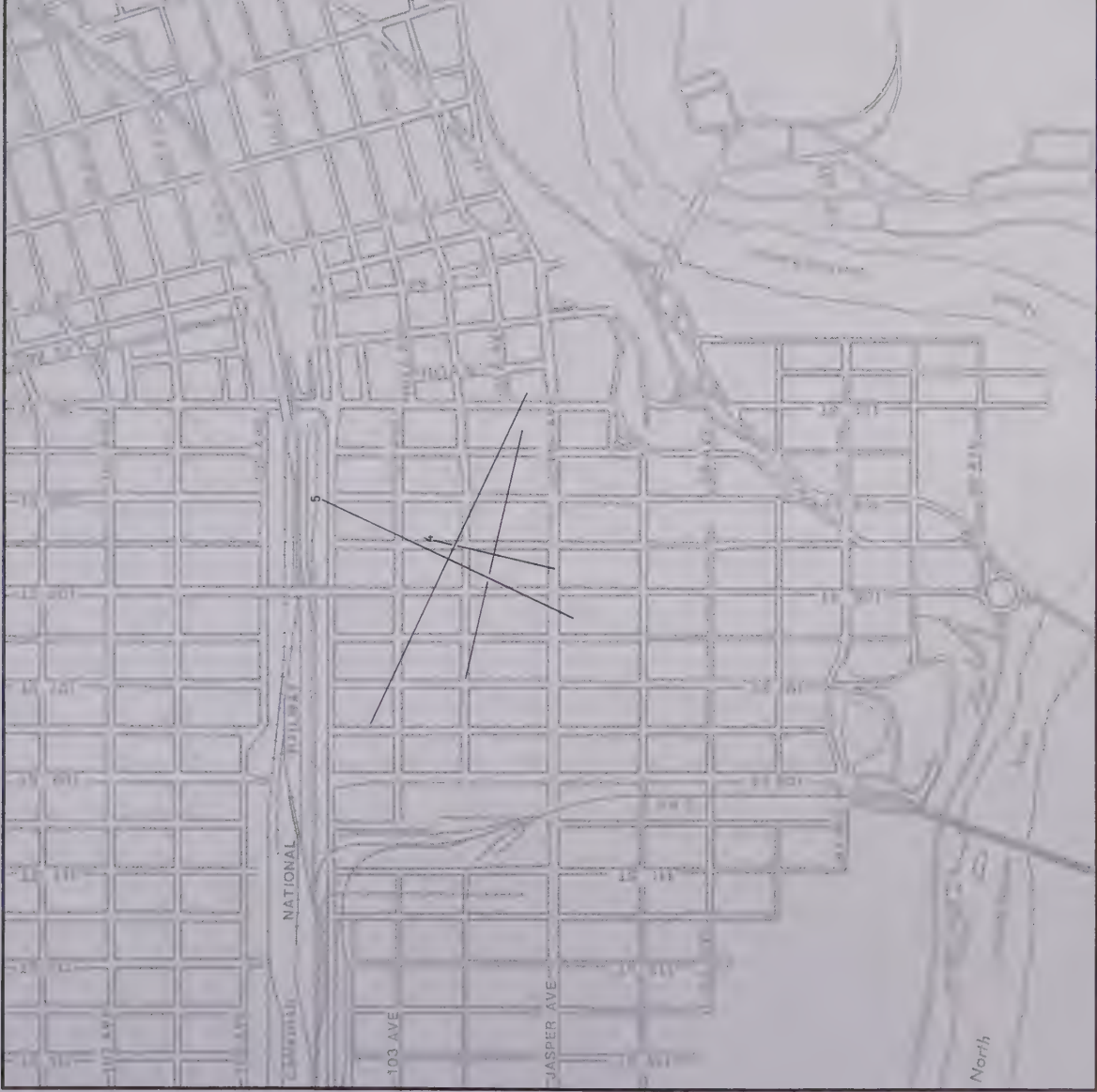
### STANDARD DISTANCE PARAMETER

1	1950-51
2	1954-55
3	1959-60
4	1964-65
5	1969-70



G. H. Z.

Figure 2 2 4











**B30009**